Narelle and Paul van den Bos

Freight – and the (potential) role of Newcastle

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Good Afternoon Honourable Robert Brown and Committee Members

I will give a brief overview of the submission we made.

In 1990, we formed our company Paul van den Bos & Associated Pty Ltd (ABN 65 050 335 487), and operate under the trading name Transport Modelling.

We specialise in the numerical and analytical aspects of the land use – transport interface.

Our colleagues in three States have recognised our knowledge and skills in this area, with the result that our company is on the ACT, NSW and QLD State Government transport modelling panels – since the inceptions of those panels until today.

We write this submission because of the **lack of attention to the science of transport revealed in the Moorebank/Port Botany Interaction**. There has been glaring mistakes in their advertising.

We receive no payment for this work → we do this because we want the best for our society.

The NSW Government policy:

use Port-Botany - Moorebank option to service the future City

We feel this has not been considered in detail:

- The SIMTA EIS casts doubt on the rail capacity to serve Moorebank as well as the other intermodal terminals
- The NSW Freights and Ports Strategy spells out in detail, that there is no road capacity around the Moorebank Intermodal Terminal to take the additional intermodal traffic
- Our second book contains a list of 34 network sites around Moorebank Intermodal that affect existing and future traffic flows. This list has been extracted from traffic studies in our area.
- Examination if the Moorebank Intermodal Terminal Project, Detailed Business Case, shows that it is extremely unlikely, that $10 billion of economic benefits can be achieved.

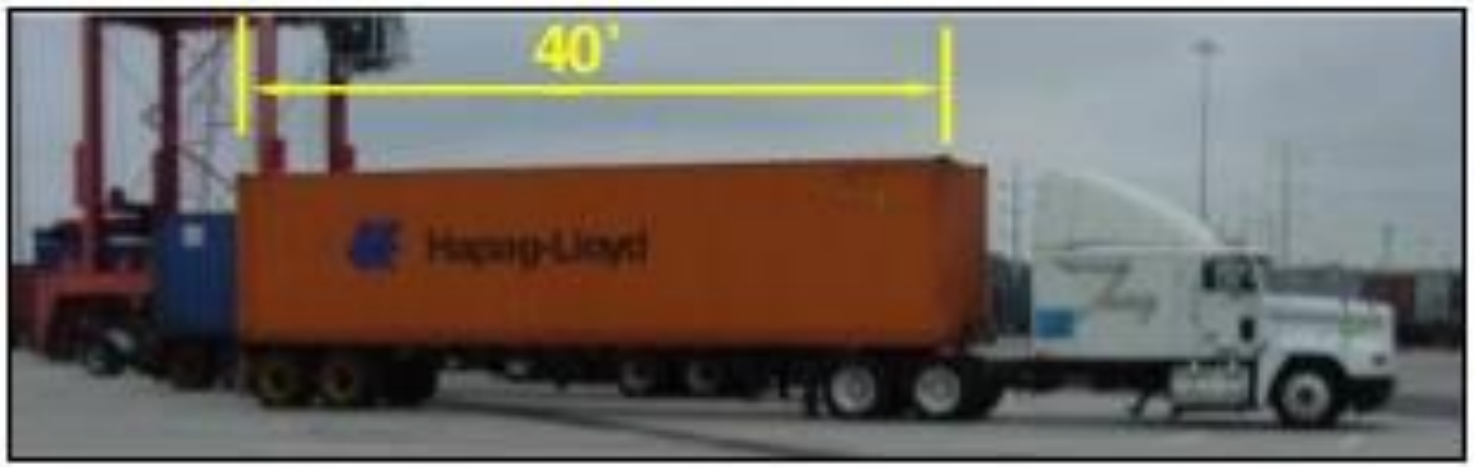
Submission to encourage a report comparing Port Newcastle, Port Botany and Port Kembla

1. Sydney's growth area is Sydney West therefore this is the location of growth in freight
2. NSW Government policy Solution – Freight arrives at Port Botany railed to Moorebank then trucked to Destinations
3. Using this policy it appears that freight rail upgrade may not meet demand - even when completely duplicated
4. Using this policy the road network capacity will not meet demand
5. Australian Government economic benefits of Moorebank was incorrect
6. At least use Port Newcastle to send freight that is required North of Newcastle
7. When Port Botany was sold there were incomplete published plans on how to move the additional freight by rail and road
8. Freight coming from Newcastle or Port Kembla needs more thorough investigation

Twenty-foot Equivalent Unit TEU

Always expressed as	TEU (per year)
Rail engineers use:	trains per day
Traffic engineers use:	vehicles per(peak) hour

One 20' container = 1 TEU



One 40' container = 2 TEU

1. Sydney's growth area is Sydney West therefore this is the location of growth in freight

For planning purposes: yellow area
Population 2 x Brisbane Freight = 2 x Brisbane

NSW Government estimates: - 20 years
Approximately 2,000,000 TEU's

- 1,500,000 TEU's for Badgerys Creek
- 500,000 TEU's for Eastern Creek

Possible options:

- **Port Newcastle**
- **Port Botany**
- **Port Kembla**
- **combination**

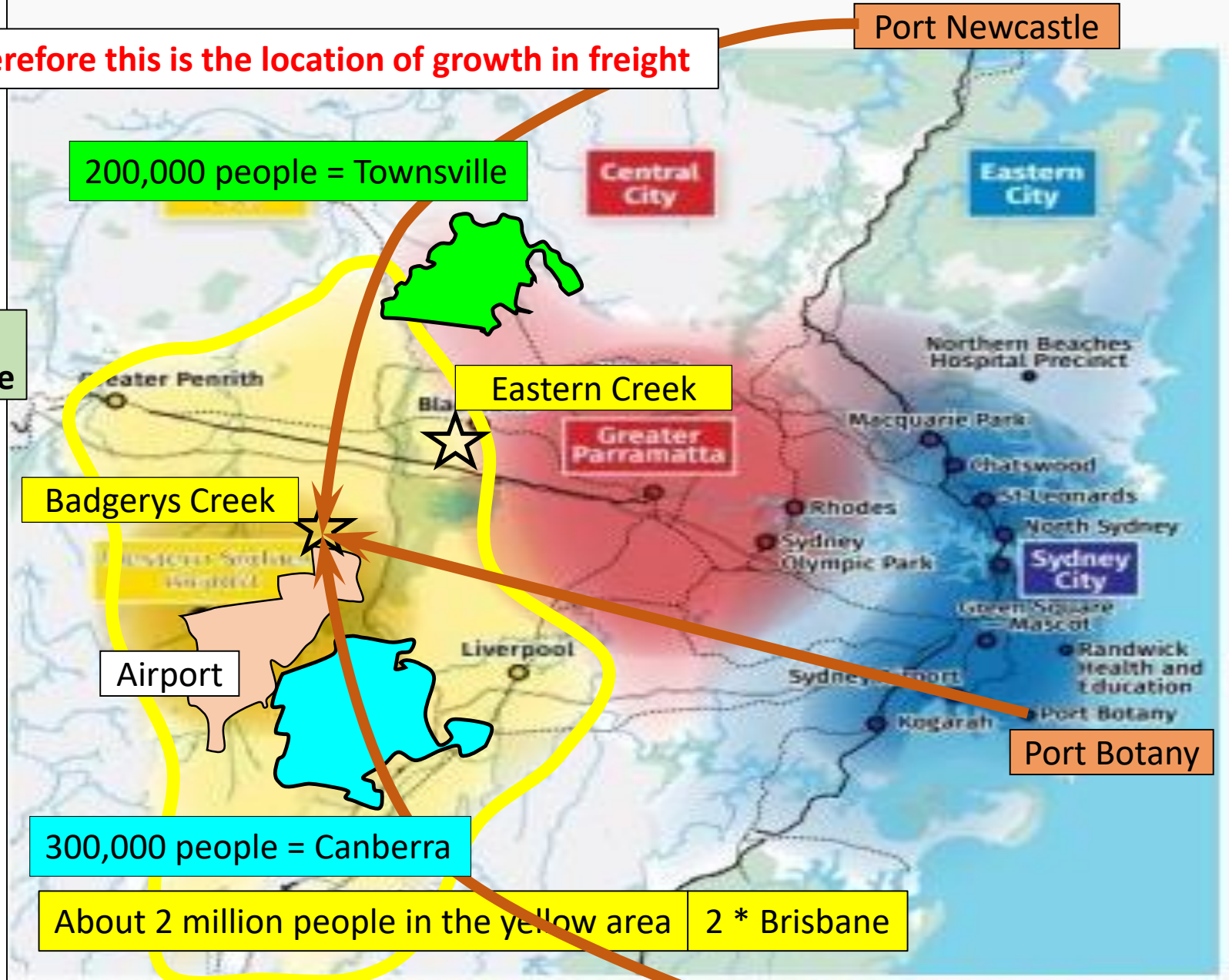


PHOTO: The Greater Sydney Commission has created three cities within Sydney in its 40 year plan.
(Greater Sydney Commission)

2011 commecial vehicle FROM Port Botany

2. NSW Government policy Solution – Freight arrives at Port Botany goes by rail to Moorebank then trucked to Destinations

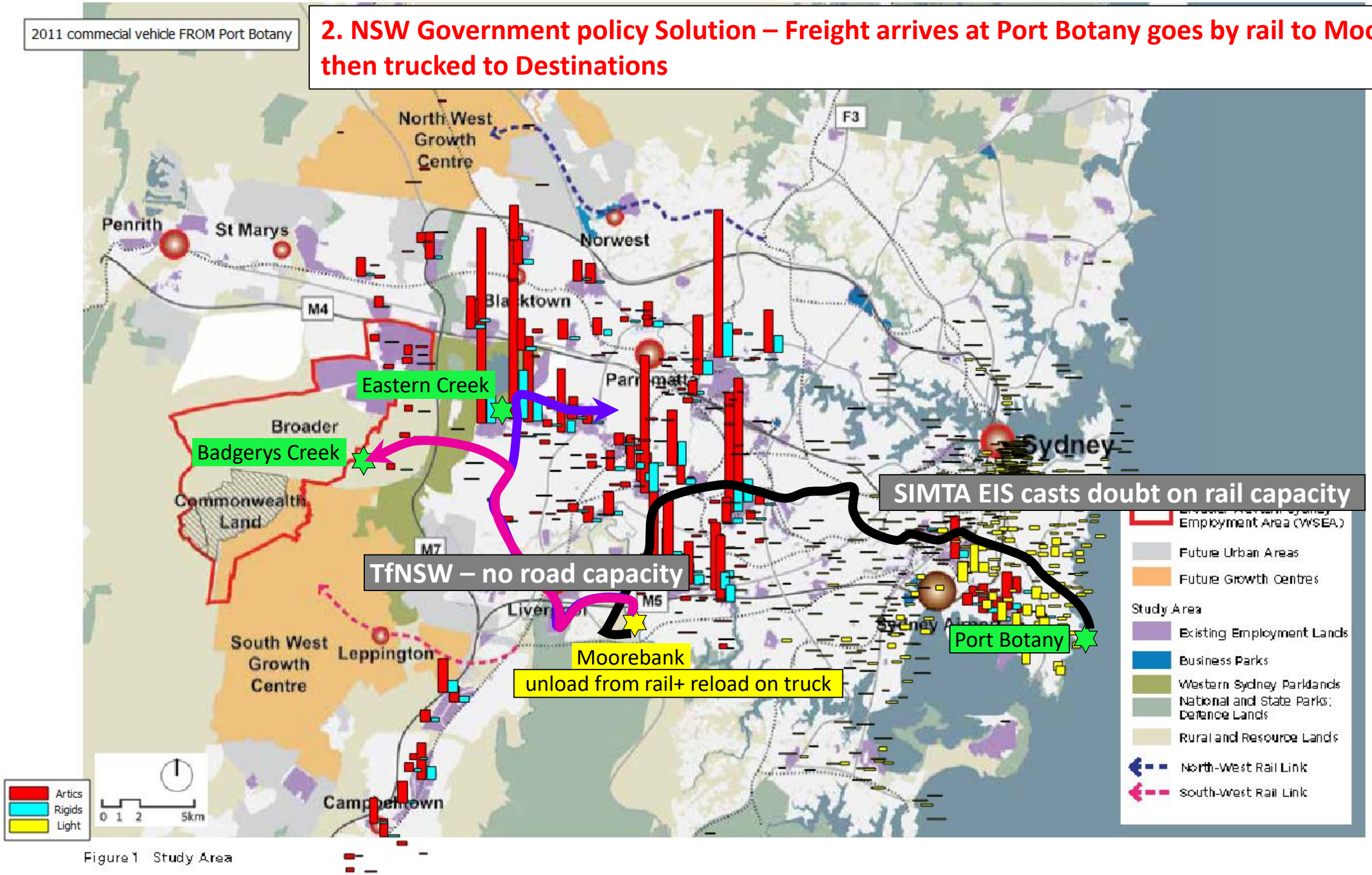
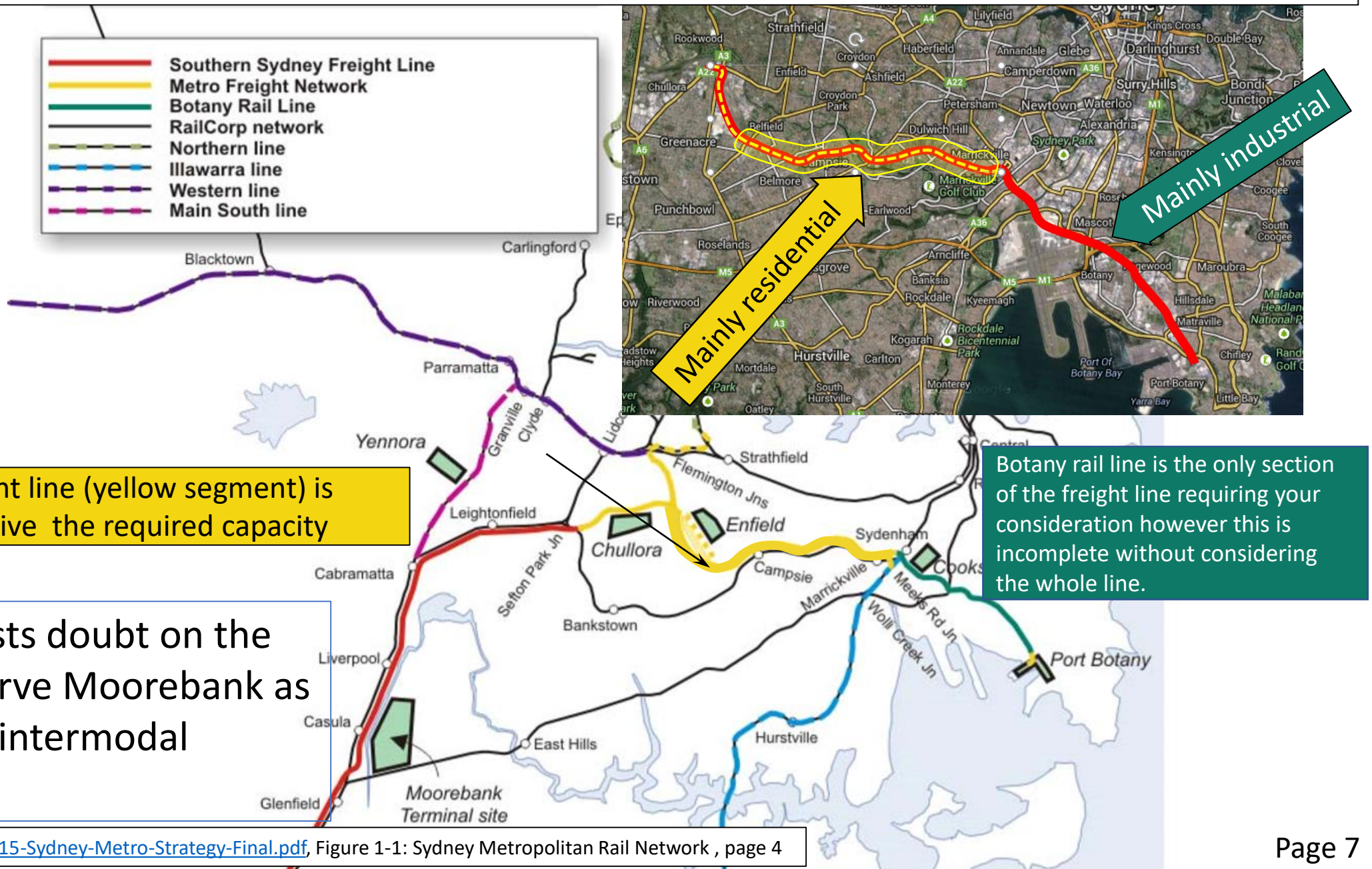


Figure 1 Study Area

3. Using this policy it appears that the freight rail upgrade may not meet demand - even when completely duplicated. Only the first section has been planned.



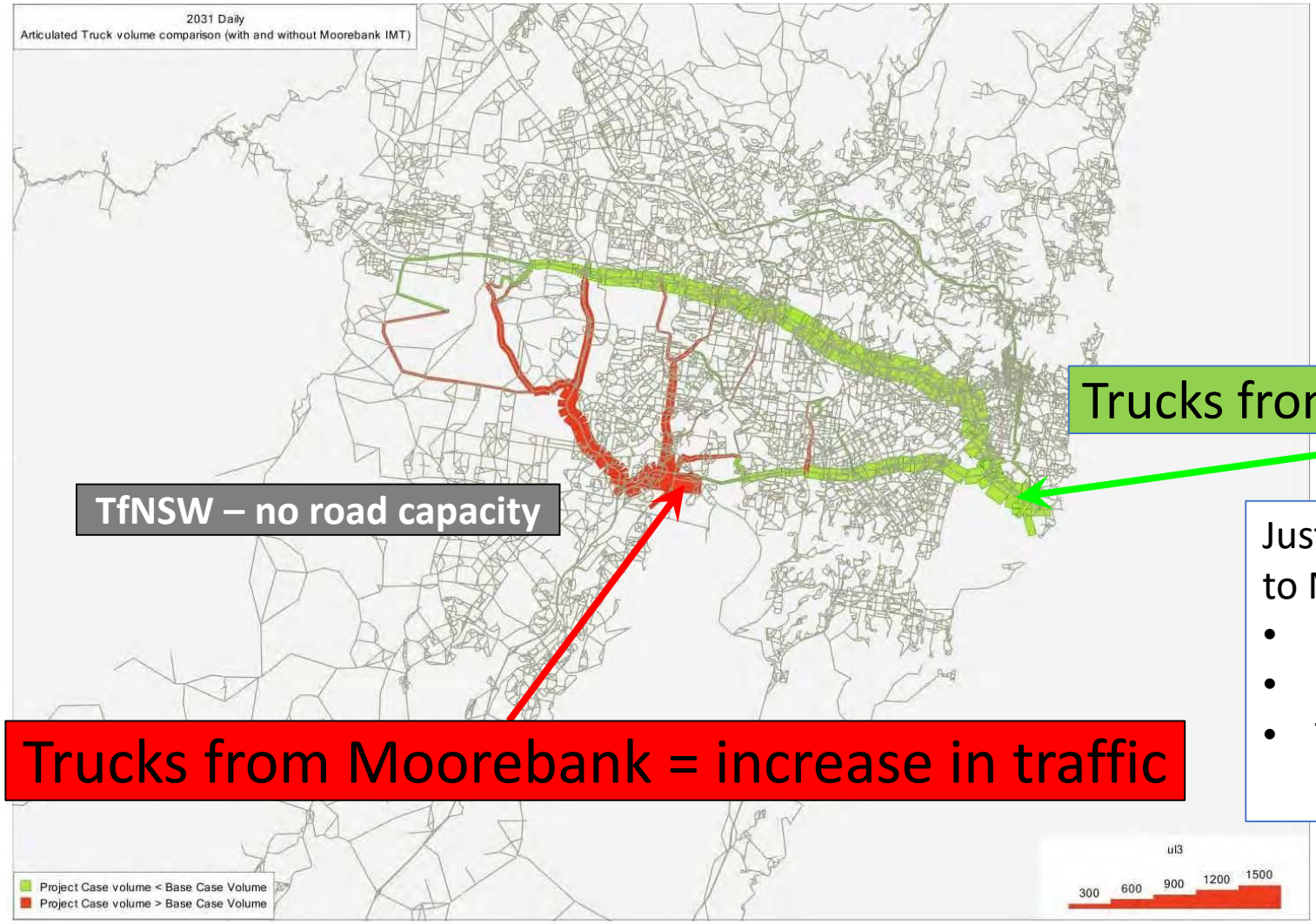
Even if the Metro freight line (yellow segment) is duplicated it may not give the required capacity

Botany rail line is the only section of the freight line requiring your consideration however this is incomplete without considering the whole line.

The SIMTA EIS casts doubt on the rail capacity to serve Moorebank as well as the other intermodal terminals

http://www.artc.com.au/uploads/2015-Sydney-Metro-Strategy-Final.pdf, Figure 1-1: Sydney Metropolitan Rail Network , page 4

4. Using this policy the road network capacity will not meet demand



When Moorebank is opened

green = reduction in traffic

red = increase in traffic

band width is to scale therefore the wider the band the more traffic

Trucks from Port Botany = reduction in traffic

TfNSW – no road capacity

Trucks from Moorebank = increase in traffic

Just shifting the traffic problems from Port Botany to Moorebank!

- Moorebank has no infrastructure to cope.
- It has not adapted over many years.
- Therefore this solution does not work without huge resources to fix the roads.

Figure 4.2: Comparison of articulated truck volumes ('Project Case' versus 'Base Case')

CASE STUDY 16 SUPPORTING THE DEVELOPMENT OF THE MOOREBANK INTERMODAL PRECINCT

The Moorebank precinct has been identified by the Australian and NSW Governments as a key strategic location to increase intermodal capacity. Two intermodal terminals are planned in the precinct; the Moorebank Intermodal Terminal (MIT) has been proposed by the Australian Government for the western side of the precinct, and a privately funded Sydney Intermodal Terminal Alliance (SIMTA) has been proposed for the eastern side. Once complete, these two IMTs are expected to result in up to two million TEU of intermodal terminal capacity.

Transport for NSW expects the development of these two intermodal terminals in the Moorebank precinct to place significant strain on the surrounding local road network. While not all effects of terminal developments have been identified at this time, initial analysis suggests the following impacts to the local road network:

- Travel demand on the section of the M5 Motorway between the Hume Highway at Casula and Moorebank Ave is expected to exceed capacity as early as 2016.
- The absence of west facing ramps from the M5 to the Hume Highway results in a significant number of vehicles using Moorebank Avenue to access the Liverpool CBD.
- By 2026 growth in background traffic will result in peak spreading and traffic conditions similar to the existing peak period in the Liverpool area and on the M5, persisting for most of the day.
- Key intersections providing access to the Moorebank intermodal precinct will exceed capacity with volumes, especially of turning vehicles, resulting in extensive delays, with queuing sufficient to disrupt through movement.

To support the development of the Moorebank intermodal terminals and meet the challenges posed by impact on the local road network, Transport for NSW is seeking to provide road network upgrades. The specific goals of these upgrades include:

- Providing additional capacity and traffic reliability on key routes accessing the precinct.
- Ensuring full access to the precinct for High Productivity Vehicles (HPV), including Higher Mass Limit (HML) vehicles.
- Managing the needs of the precinct in terms of road access while addressing negative externalities for the surrounding community and environment.

Transport for NSW has made a Nation Building 2 submission to undertake modelling and economic analysis to determine the optimal road upgrade package to meet the needs of the developed Moorebank intermodal terminal precinct.

4. Using this policy the road network capacity will not meet demand

NSW Government Ports and Freight Strategy: no road capacity around Moorebank Intermodal

Huge Unknown cost to the government

The cost of fixing this infrastructure is huge. Our second book contains a list of 34 network sites around Moorebank Intermodal that affect existing and future traffic flows. These locations have been identified by Bankstown, Liverpool and Campbelltown councils as well as by SIMTA and the NSW government.

Fixing these road infrastructures as well as the rail capacity would involve huge government expenditure i.e. tax payers money. One overpass alone could cost $500,000.

We have not seen documents outlining these costs. There could be bigger ‘bang for buck’ spending our tax dollar in better planned ventures.

5. Australian Government economic benefits of Moorebank was incorrect

3,300 trucks cannot come off the road because they do not go to Moorebank

Australian Government
Department of Finance and Deregulation

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  - Property and Construction
  - Moorebank Intermodal Terminal Project
- Advertising - Campaign and Non-Campaign

Home >> Land, Property and Asset Management >> Moorebank Intermodal Terminal Project

Moorebank Intermodal Terminal Project

In April 2012 the Australian Government committed to development of the Moorebank Intermodal Terminal (IMT) Project after reviewing the findings of a detailed business case for the facility. You can read the executive summary [1.9 MB].

The project involves the development of freight terminal facilities linked to Port Botany by rail, increasing Sydney's rail freight capacity and reducing road freight on Sydney's congested road network.

The detailed business case identified a number of major benefits of the Project including:

- 3,300 trucks a day taken off Sydney's roads between Port Botany and Moorebank by shifting freight to rail
- Approximately $10 billion in economic benefits including reduced freight costs, reduced traffic congestion, reduced traffic accidents and improved productivity.
- Improved environmental outcomes, with less fuel used and less emissions due to reduced road freight – trains generate fewer emissions and use less fuel than trucks for each container moved.
- An estimated total of 2,625 construction jobs for the port shuttle and interstate terminals and a further 1,700 jobs for the south western Sydney region.

The design, construction and operation of the terminal will be undertaken by the private sector through a competitive process, in which they will be provided with an opportunity to contribute to the overall funding of the Project. The Government will establish a Government Business Enterprise to manage the process from 2013.

Funding for the next year of preparatory work for the project will be released in the Federal Budget on 8 May, enabling further development of plans for a port shuttle terminal to open in mid-2017.

The project is subject to planning approval with a draft Environmental Impact Statement due to be displayed late in 2012 to enable public feedback. Both Federal and NSW planning approval is being sought.

Background

In May 2010 the Australian Government tasked the Department of Finance and Deregulation to conduct a Feasibility Study (the Study) into the potential development of an intermodal terminal (IMT) at Moorebank in south western Sydney. The Study, comprising the development of a detailed business case, concept plan and environmental planning approval process, has been assisted by a group of advisers led by KPMG. The Study includes a detailed examination of economic, financial, social, environmental and technical issues.

The corporate advisory firm, Greenhill Caliburn Pty Ltd, confirmed that the recommendations of the detailed business case will optimise early private sector involvement and investment through an open and transparent process, whilst ensuring that the Commonwealth's objectives are met to the maximum extent possible; and the Commonwealth site is the better option than the adjacent private sector site due to its closer proximity to connecting infrastructure and capacity for full interstate service delivery.

- Greenhill Caliburn - Peer Review Phase 1 Report [584 KB]
- Greenhill Caliburn - Peer Review Phase 1 Report [1.34 MB]

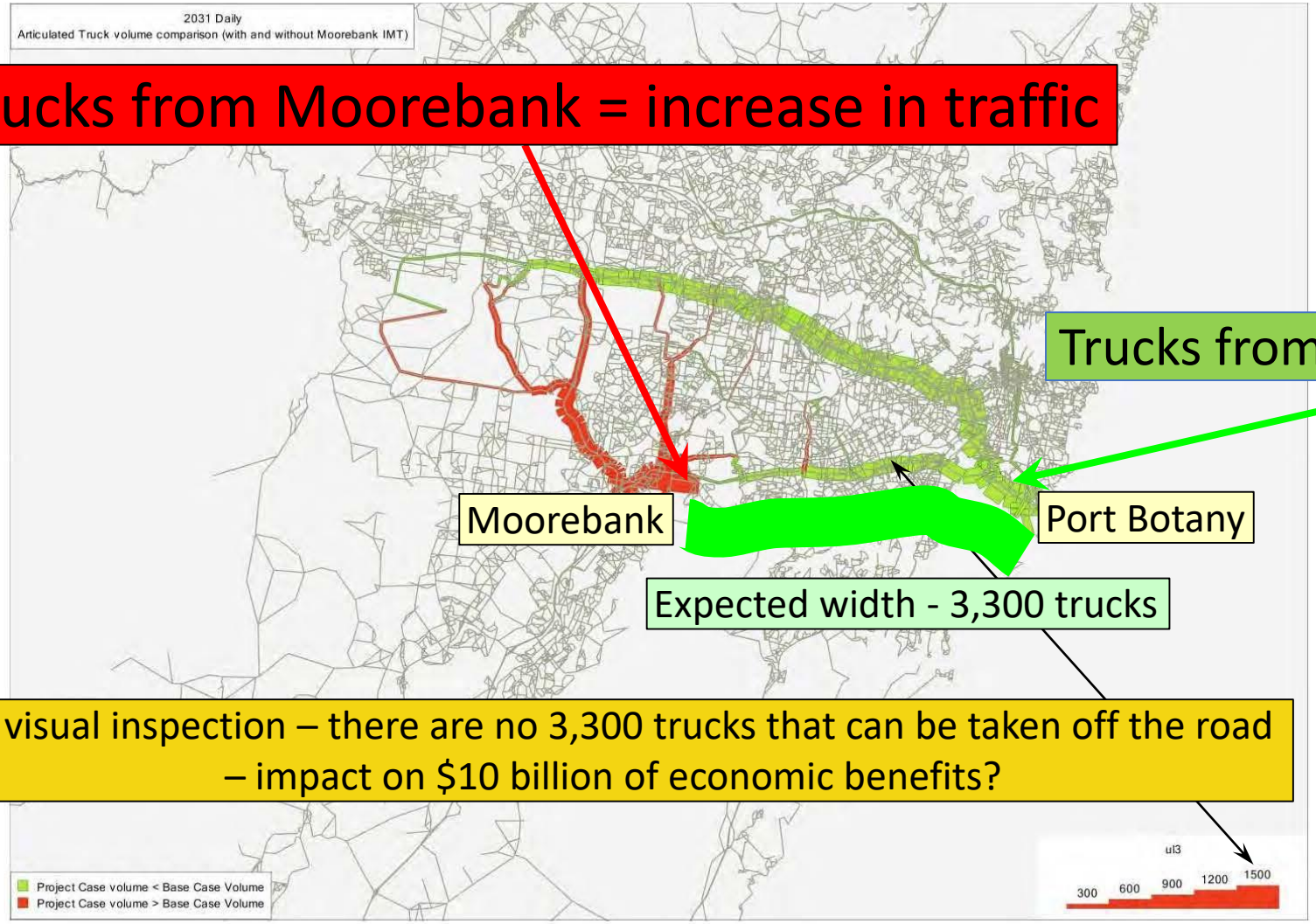
Other Languages

- عربي - Arabic
- 中文 - Chinese(Simplified)
- Hrvatski - Croatian
- Filipino - Filipino
- ខ្មែរ - Khmer
- Македонски - Macedonian
- Samoan - Samoan
- Српски - Serbian
- Español - Spanish
- Tiếng việt - Vietnamese
- Türkçe - Turkish

Remove 3,300 trucks per day

$10 billion in economic benefits

5. Australian Government economic benefits of Moorebank was incorrect



Trucks from Moorebank = increase in traffic

Trucks from Port Botany = reduction in traffic

Moorebank

Port Botany

Expected width - 3,300 trucks

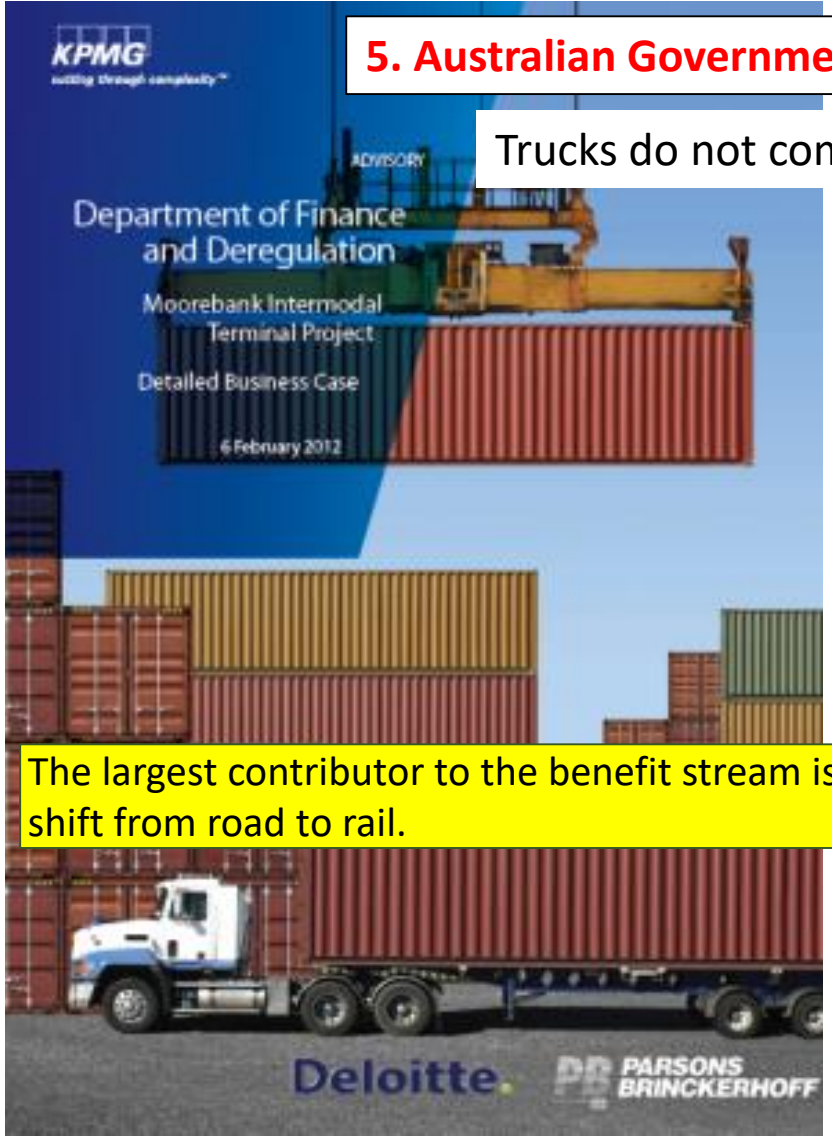
By visual inspection – there are no 3,300 trucks that can be taken off the road – impact on $10 billion of economic benefits?

Scale: Max 1,500

Figure 4.2: Comparison of articulated truck volumes ('Project Case' versus 'Base Case')

5. Australian Government economic benefits of Moorebank was incorrect

Trucks do not come off the road therefore benefits are incorrect

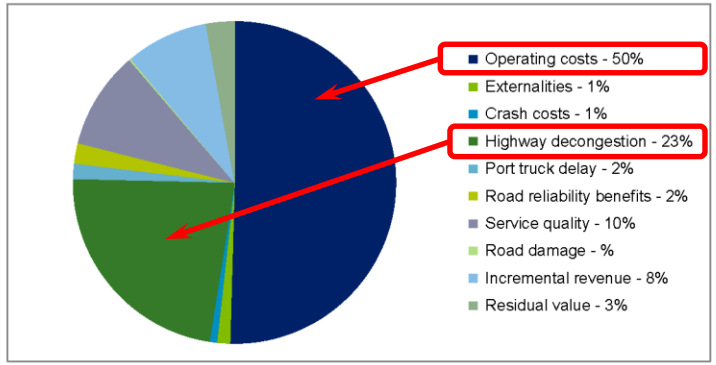


50% + 23% = 73%
Of all the benefits from mode shift

The largest contributor to the benefit stream is operating cost savings resulting from a mode shift from road to rail.

73 % of the benefits do not exist so this makes Port Botany and even less likely solution to the problem of freight for our future growth.

Graph 7.1 – Distribution of Project Benefits



Source: Deloitte

The project generates benefits in both the IMEX and interstate markets. Of the two markets, IMEX traffic generates a higher proportion of benefits than interstate. This reflects the significantly higher IMEX container volumes using rail in the project case compared to interstate.

The largest contributor to the benefit stream is operating cost savings resulting from a mode shift from road to rail. This benefit arises because the unit cost of rail is reduced in the project case as the Moorebank IMT provides more intermodal capacity in Sydney which removes an operating constraint which is apparent in the base case. Consequently, more containers can be transported from Port Botany to Moorebank by rail and this creates economies of scale of operation which reduce the price of rail freight. This makes it a more attractive option than road and results in a mode shift from road to rail. Given the higher utilisation and economies of scale of rail[52], operating cost benefits resulting from the project are significant.

Other significant project benefits also arise as a result of the mode shift from road to rail including road congestion relief benefits (23 per cent of total benefits) and rail service quality improvements (10 per cent).

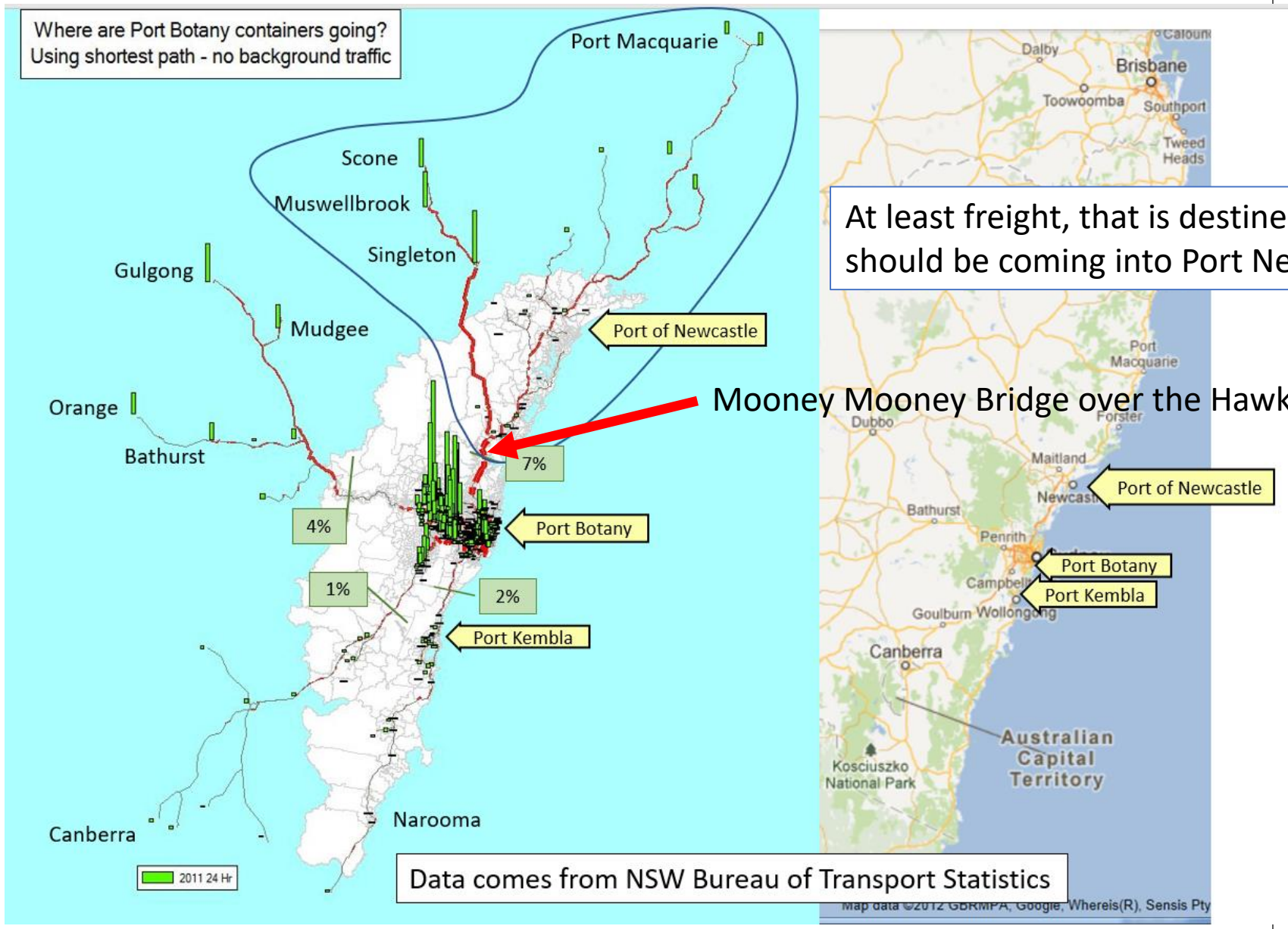
7.2.3 Project Capital Costs

[redacted]

[52] An IMEX container train can carry 70 TEU per trip compared to a maximum 2 TEU for a semi-trailer and 3 TEU for a B Double.

6. At least use Port Newcastle to send freight that is required North of Newcastle

Figure 10 Where is Port Botany's freight going to? (2011)



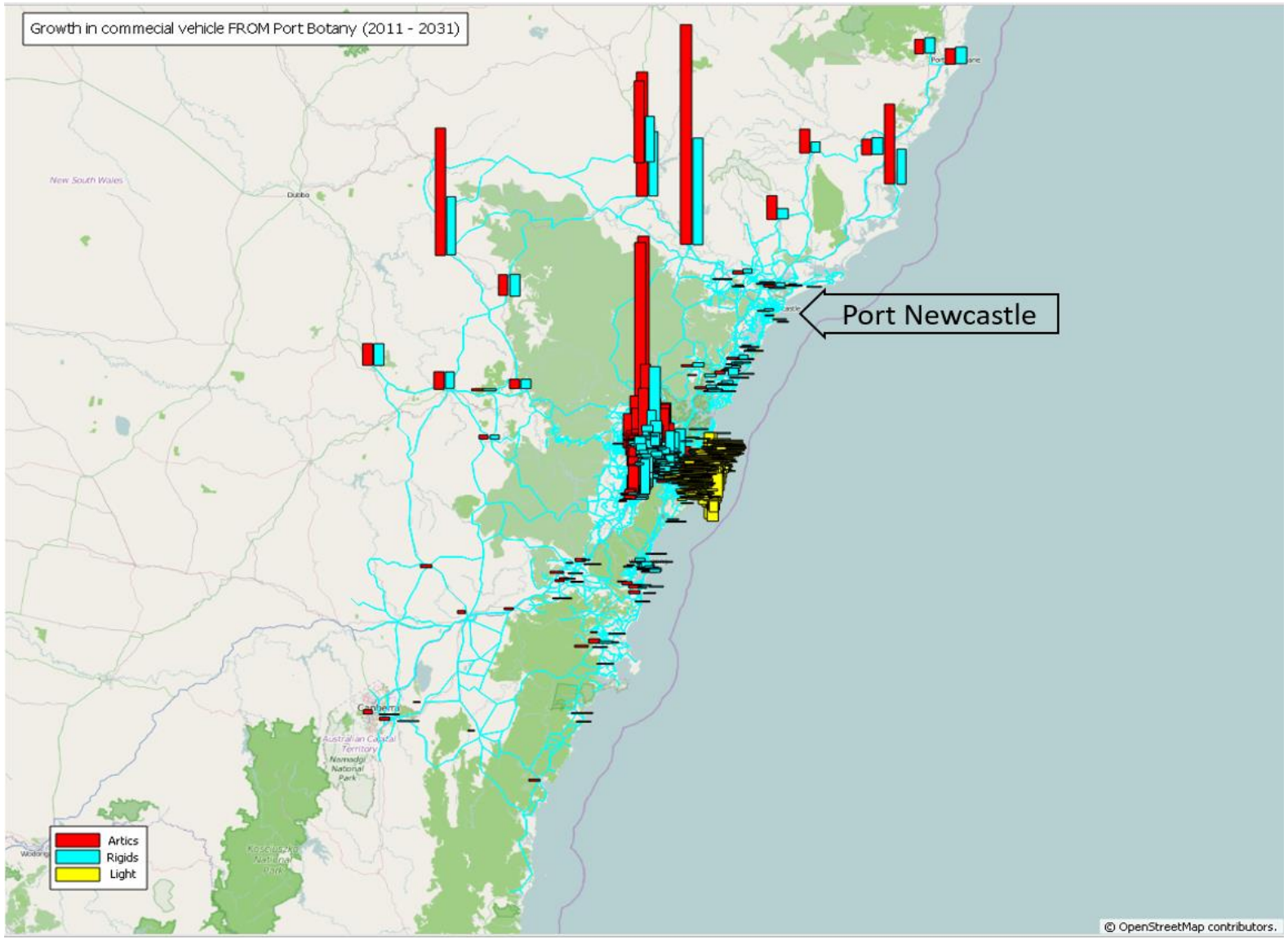
At least freight, that is destined for locations past Newcastle should be coming into Port Newcastle not Port Botany

Mooney Mooney Bridge over the Hawkesbury river

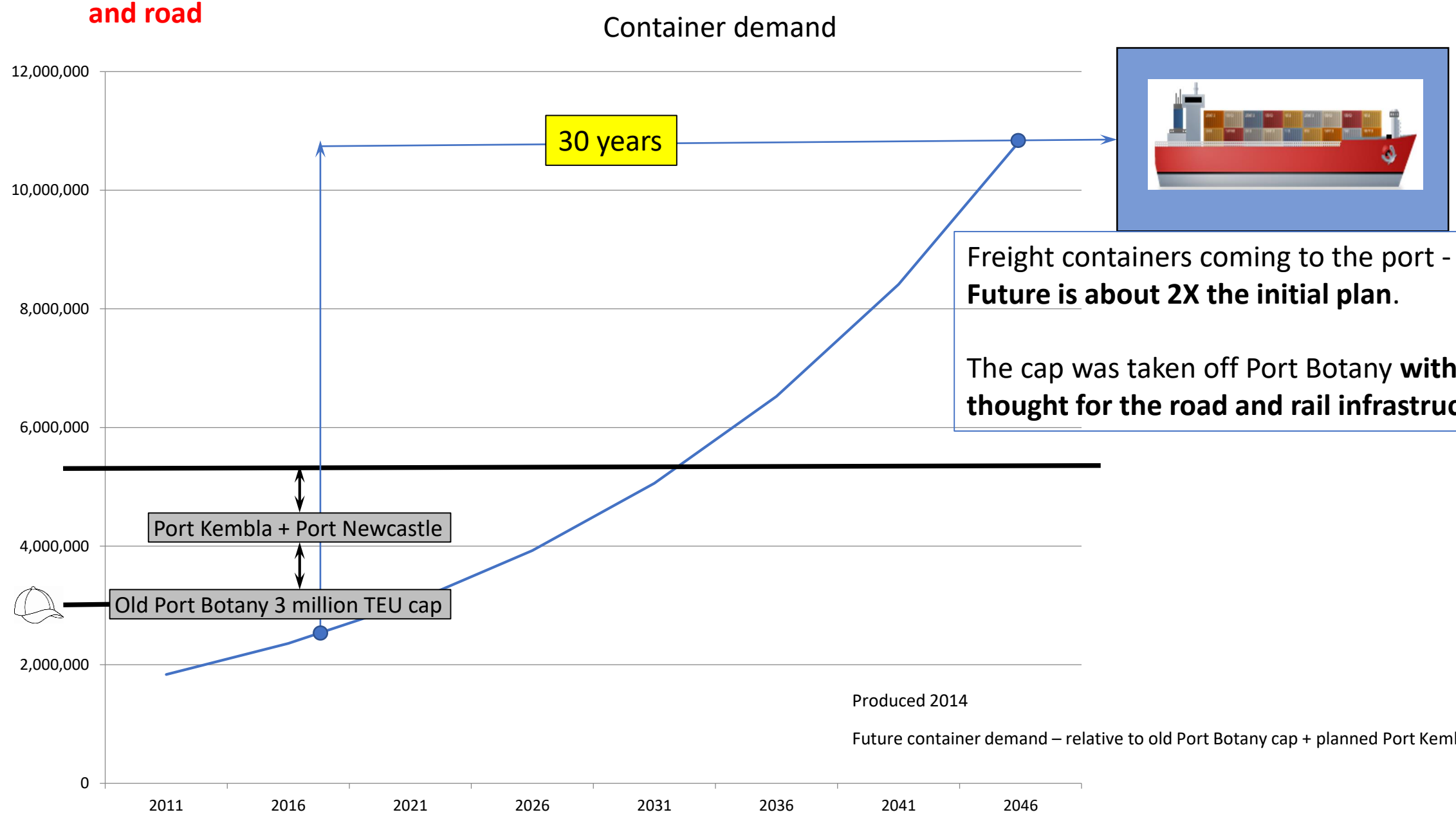
6. At least use Port Newcastle to send freight that is required North of Newcastle

Figure 11 Growth in freight between 2011 and 2031 (old data - NSW TDC)

Future freight requirements



7. When Port Botany was sold there were incomplete published plans on how to move the additional freight by rail and road



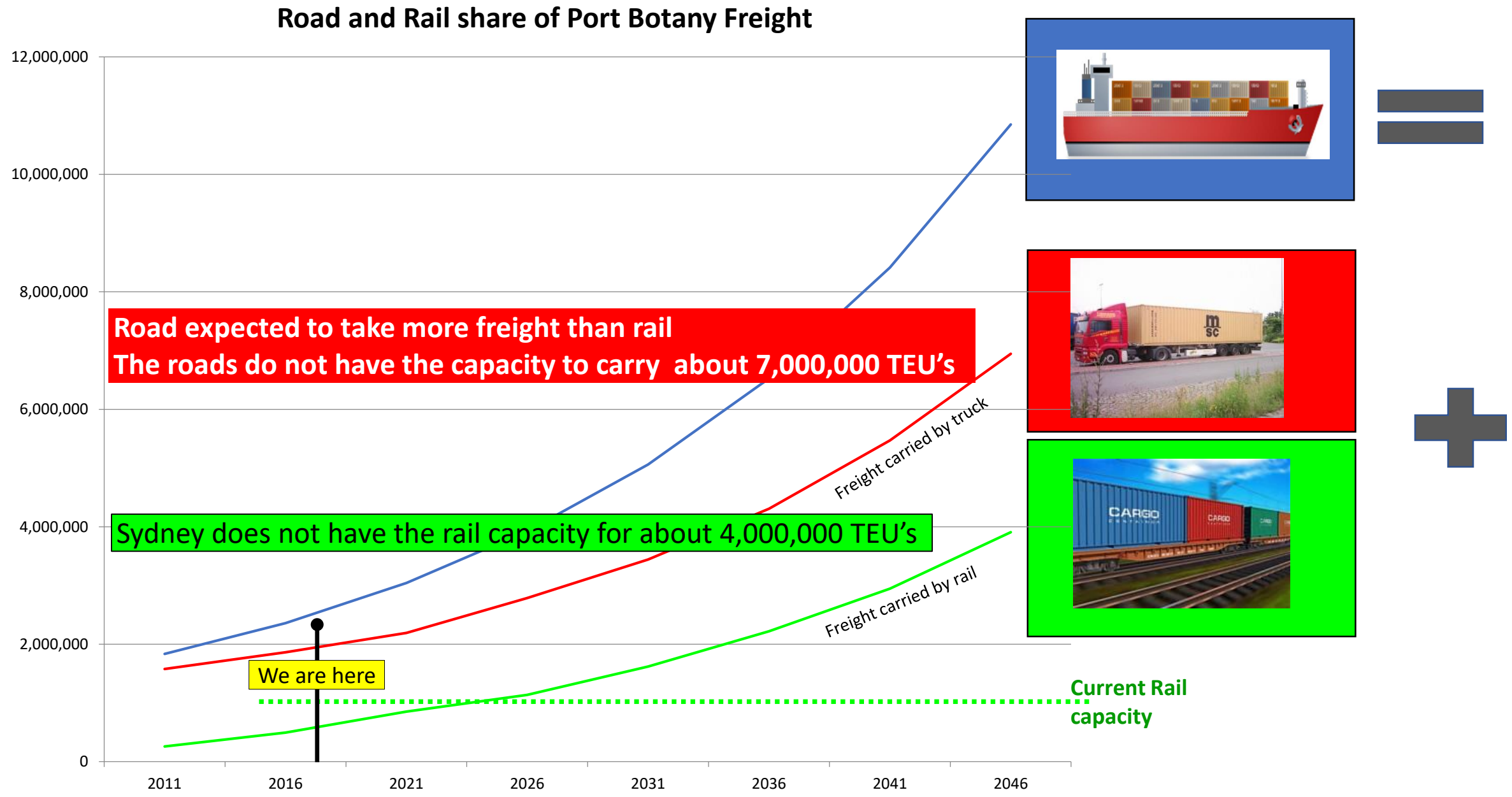
Freight containers coming to the port - Sea side.
Future is about 2X the initial plan.

The cap was taken off Port Botany **with limited thought for the road and rail infrastructure**.

Produced 2014

Future container demand – relative to old Port Botany cap + planned Port Kembla + Port Newcastle

7. When Port Botany was sold there were incomplete published plans on how to move the additional freight by rail and road



8. Freight coming from Newcastle or Port Kembla needs more thorough investigation

This image comes from the Federal and NSW State Government report, showing their “broad brush” plan of a possible future rail bypass.

On the image on the left-hand side, we have pencilled in the proposed rail line to the future Airport on the “broad brush” line.

We have also pencilled in the Maldon – Dombarton rail line on the south.

In *the centre is the NSW Government’s artist impression future intermodal near the airport (from Draft Broader Sydney Employment Area Structure Plan)*

The image on the right-hand side represents the close up of the future Airport and the two intermodals: Badgerys Creek and Eastern Creek.

Eastern Creek is a stone’s throw from Wetherill Park industrial estate where 45% of the current Port Botany freight destination goes.

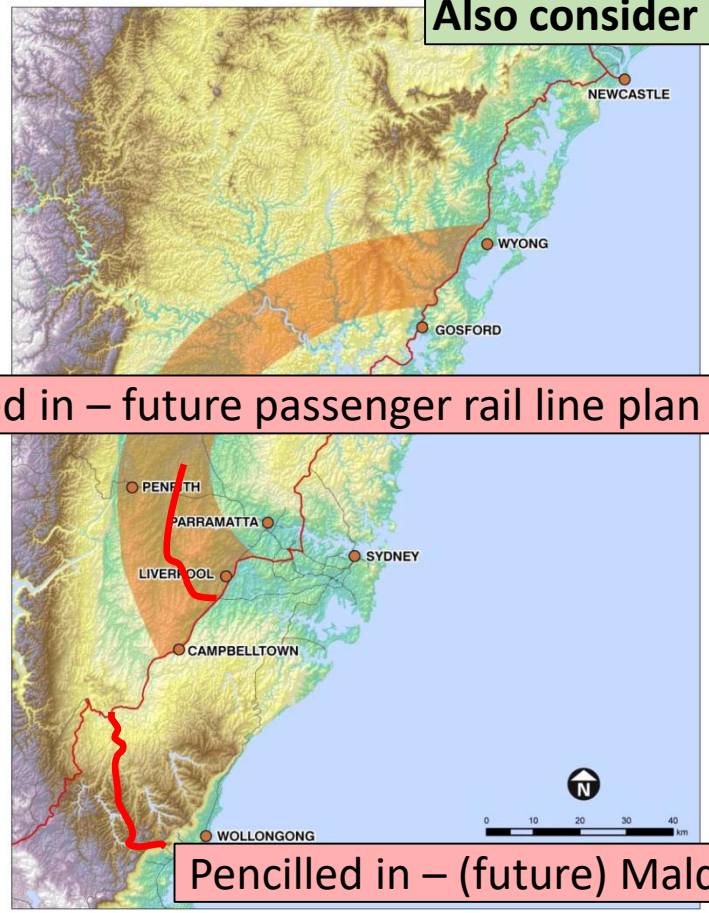
8. Freight coming from Newcastle or Port Kembla needs more thorough investigation

Australian Government

NSW GOVERNMENT Transport for NSW

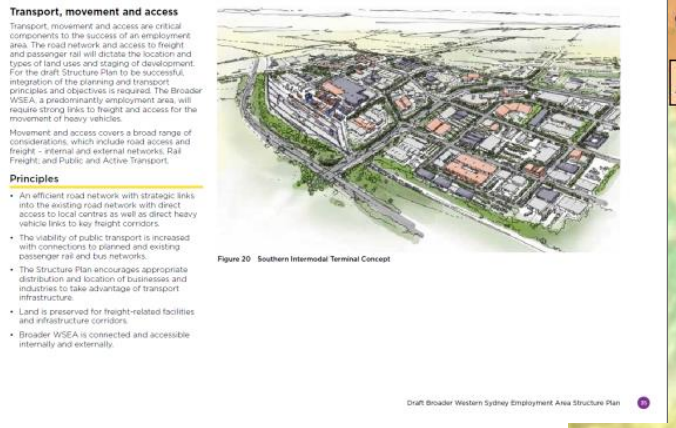
Not only Freight = 2 x Brisbane (Badgerys Creek)
Also consider Wetherill Park: serves existing 45% of Port Botany freight - Eastern Creek (planned)

Figure 10: Indicative corridor for a Sydney rail bypa

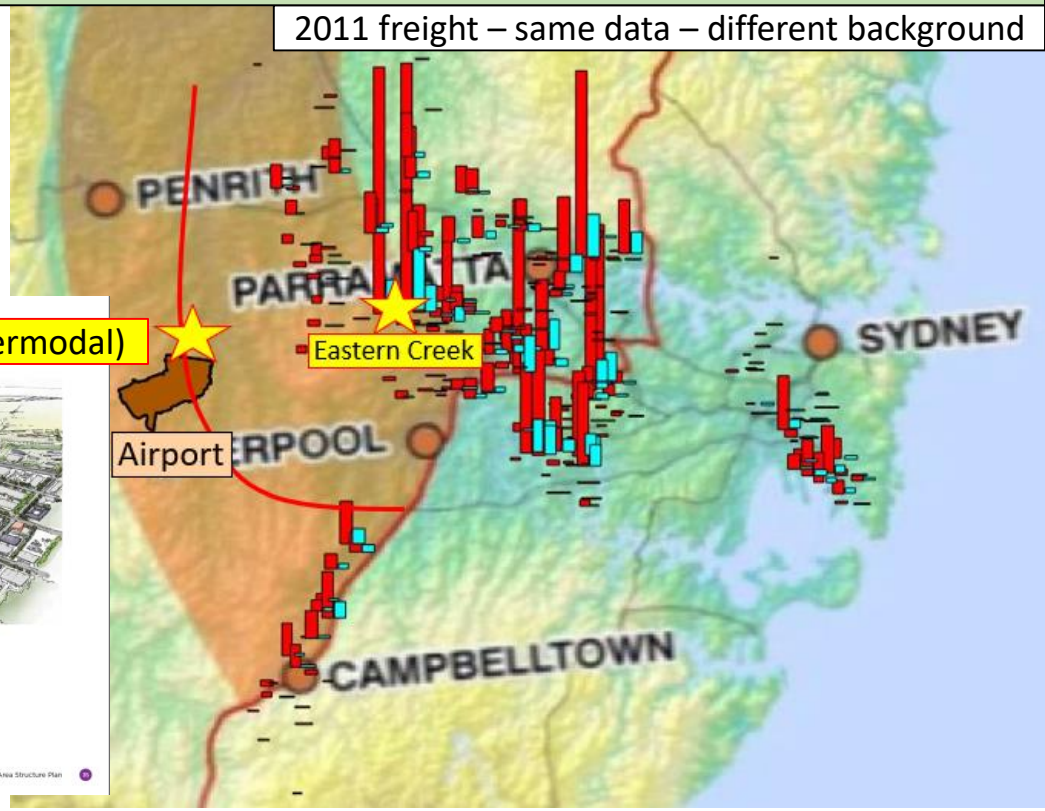


Pencilled in – future passenger rail line plan

Badgerys Creek (Southern Intermodal)



2011 freight – same data – different background



Pencilled in – (future) Maldon – Dombarton rail line

The concept of constructing a rail bypass around Sydney is therefore a long-term proposition. It needs to include a link to the metropolitan freight network and would require detailed alignment analysis, environmental impact assessment and route acquisition prior to commencement of construction. In order to be of benefit the entire project would have to be completed in one stage and would need to have a dedicated connection to an extended metropolitan freight network. Whilst it is premature to estimate the possible cost, it could be expected to run into many

Northern Sydney Freight Corridor Program
Scoping Phase Completion Report

Page 38 of 42

A feasibility study (including possible routes, costs and an economic benefit analysis) is required for moving freight from Port Newcastle to Sydney West growth centre.

Possible new rail lines could be more cost effective than fixing problems created from the government solution to move freight through Sydney traffic.

Conclusion

We urge the committee to consider

- an open and transparent report that compares the three Port options for determining the optimal solution to serve the new city with freight.
- that the report be robust.
- that the reports detail the economics (benefits and costs) of getting containers from the Ports to the new City – calculated on sound science for all the options.

  At the moment the Port Botany – Moorebank option has unknown costs to implement and it cannot deliver the economic benefits originally proposed
- that the report be publicised for scrutiny by the taxpayer
- that there be no constraints put on any Port until these studies have been carried out scientifically and costed honestly

Answers to possible questions

We have grouped the demographic icons together.

- Housing, car trips, hospital beds, and public transport combined is expected to have an average growth of about 30%
  - Plus or minus a bit

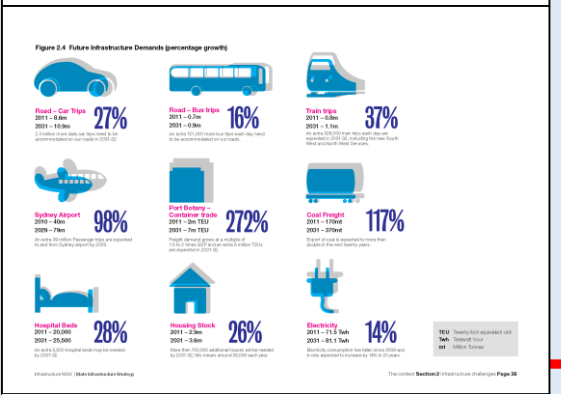
Below the line

- Electricity, is expected to have ½ the population growth
- Sydney airport is expected to grow more than 3 * demographic average
- Port Botany is expected to grow more than 10 * demographic average

The high expected growth is the background reason for WestConnex + Gateway projects

Since 85% of all the freight is consumed in Sydney, the 10 * increase means:

- In 2012, we would go out and buy 1 microwave
- In 2022, we would go out and buy about 10 microwaves, or about 10 * every thing we buy now



The context **Section 2** Infrastructure challenges **Page 38**

WestConnex + Gateway

Housing stock

Road - car Trips

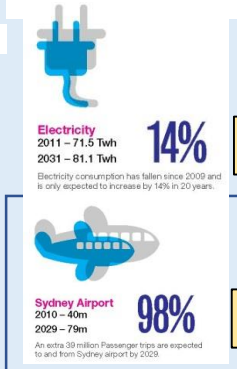
Average: 29% --- range plus 4% and minus 3%
Fairly consistent for estimates for 20 years from now

Hospital beds

Existing: 0.7 + 0.8 = 1.5m
Increase: 0.9 + 1.1 = 2.0
Increase: 0.5/1.5 = **33%**

Demographics

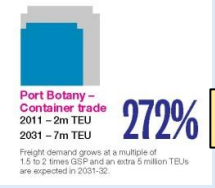
Non-demographics



Electricity - Less than ½ of demographic average

Airport - More than 3 times demographic average

Reason for building WestConnex + Gateway



Port Botany - Almost 10 times demographic average

"consumption" = 10 * higher
- **a pair of socks – buy 10 pairs**
- **a microwave – buy 10 microwaves**

Does this make sense – to anyone?

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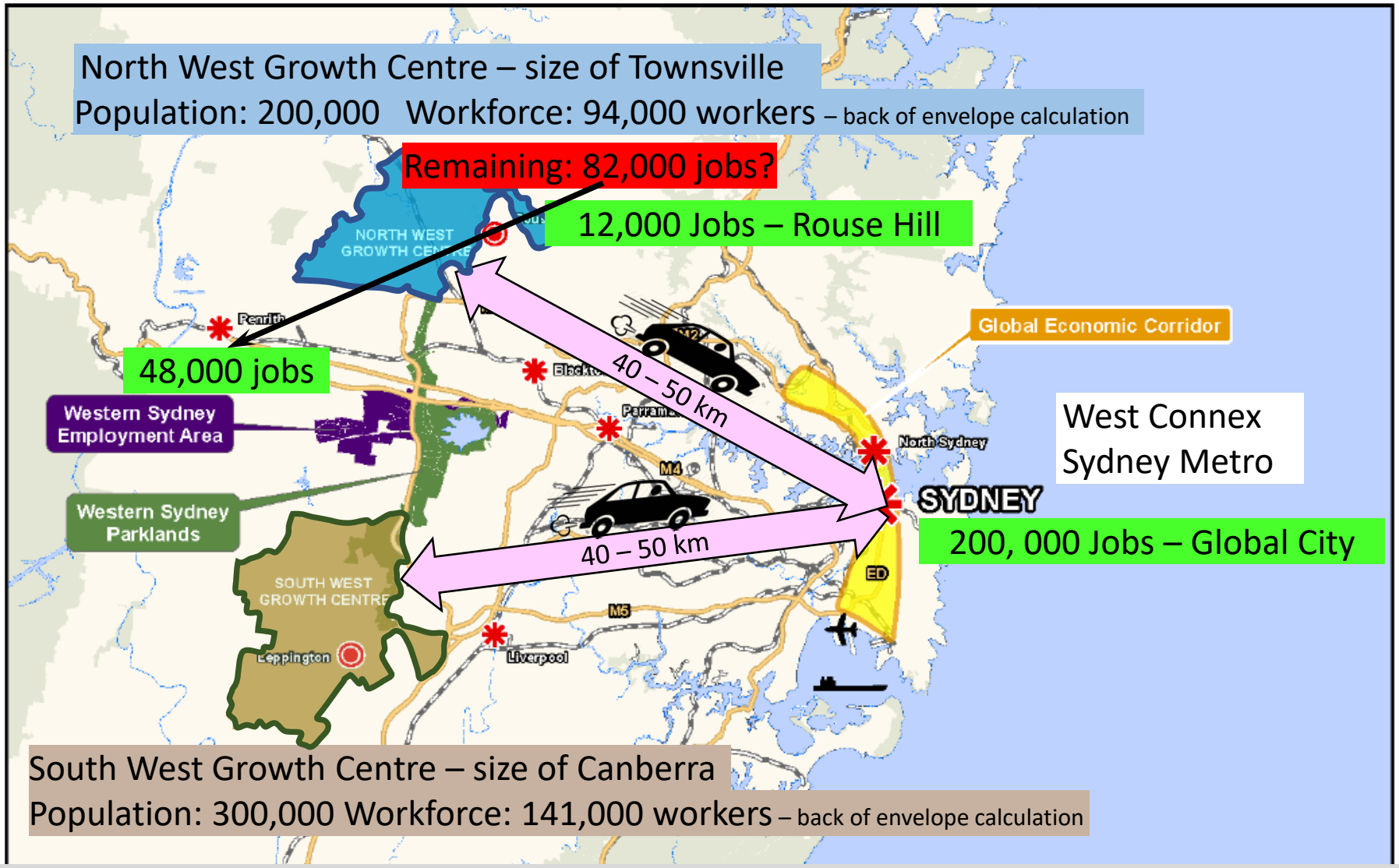
First things first

The State Infrastructure Strategy 2012 – 2032

we inform insw

Figure 3 Map of Sydney's network of existing and new centres



The analysis prepared for Infrastructure NSW by Deloitte Access Economics forecasts that around 200,000 additional jobs will be created in Global Sydney by 2031, leaving the region's share of Sydney's total jobs market unchanged from today.

Infrastructure NSW | State Infrastructure Strategy, The context Section 3 Infrastructure NSW | State Infrastructure Strategy Global Sydney Page 49

Source: Current NSW Metropolitan Plan.

Reason for building Moorebank Intermodal: freight growth rate: – 7% MICL – 9.5% SIMTA

This graphs compares estimates by various organisations.

The “we are here” points to being right on our estimate.

The other professional estimates:

- Light green – brown diagonal from the Australian Government
- Blue arrow - High growth scenario from Port Botany EIS 2013
- Green arrow – Freight Infrastructure Board – 2005
- Pink Line from MICL – off the graph
- Red dotted line from SIMTA EIS – based on Port Botany estimates – into hyper space

Difference in MICL projection and Australian Government project equals 13-15 years

Reason for building Moorebank Intermodal: freight growth rate: – 7% MICL – 9.5% SIMTA

SIMTA Environmental Impact Statement
9.5% growth 8 million

Australian Government
Department of Infrastructure and Regional Development
Bureau of Infrastructure, Transport and Regional Economics

Moorebank Intermodal Company: Public meetings 2013 – reason for building Moorebank 7% growth

5.3 2025

Difference = 13 – 15 years of historical growth continuous growth
1 million TEU / 10 years – a bit faster than population growth

NSW Transport for NSW
Bureau of Transport Statistics

3.9 2026

3.9 million TEUs (2025)
Freight Infrastructure
Advisory Board (2005)

3.3 million TEUs
"High growth" scenario
Port Botany EIS 2003

1.0 mill in 10 years

We are here

Volume (millio

6 000
5 000
4 000
3 000
2 000
1 000
0

1998–99 1999–00 2000–01 2001–02 2002–03 2003–04 2004–05 2005–06 2006–07 2007–08 2008–09 2009–10 2010–11 2011–12 2012–13 2013–14 2014–15 2015–16 2016–17 2017–18 2018–19 2019–20 2020–21 2021–22 2022–23 2023–24 2024–25 2025–26 2026–07 2027–28 2028–29 2029–30 2030–31 2031–32 2032–33

Export Import Total

Back-of-the-envelope analysis of freight growth rate

Here we did a “back-of-the-envelope” analysis of the historical growth rate.

Note there are two periods with zero – or – little growth.

Slice the time into 5 year periods, we can see that growth is roughly:

- ½ million TEU every 5 years

Between the two periods of no-growth, we can see that the growth is roughly:

- 1 million TEU per 10 years.

Use this back-of-the-envelope estimate

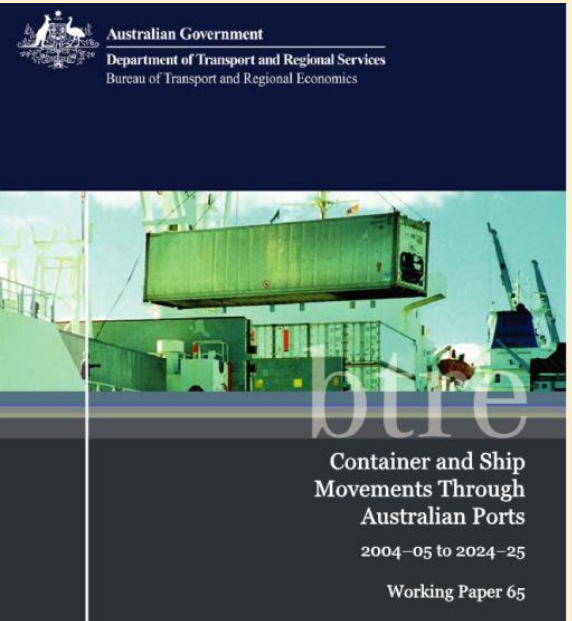


Figure copied from the Australian Government, Department of Transport and Regional Services, Bureau of Transport and Regional Economics, Container and Ship Movements Through Australian Ports, 2004-05 to 2024-25, Working paper 65. The Front Cover is on to top left hand corner. BTRE, 65

Back-of-the-envelope analysis of freight growth rate

URE 4.5 CONTAINERISED TRADE, 1993-94 TO 2024-25: SYDNEY PORTS

Capacity - 1/3

"Capacity" is understood by almost every one
the only people who have difficulties with that word are transportation and traffic engineers - it is complex.

Queueing theory -- we have "arrivals" and a "service"

- Arrivals - Imagine Coles or Woollies at peak hour -- Customers arrive at "random" - big trolleys and small trolleys
- Service rate is random

Now imagine a factory with a production line -- arrivals is constant -- service is constant.

Arrivals can be "random" or "constant" -- Service can be "random" or "constant"

The graph

- On the X axis – when we increate the arrivals 1.0 = capacity
- On the Y-axis = delay (queue length has a similar shape)

Start from zero and move towards the 1.0 (increasing the traffic)

The Random arrivals and random service (think of Coles and Woollies) gives us this curve – it turns higher and higher

This means that the queue gets longer and longer, and people have to have longer waits
When "capacity" has been reached, the store manager calls for another service to be opened.

The Constant arrivals and constant service give us the "brick wall" shape.

- If the capacity is 100 units per hour and it has to process 99 milk cartons = OK, 100 = OK, 101 – system breaks down
  - imagine what the factory looks like the next day

Random arrivals and random service has warning **before** system breaks – there will be long queues and long waits.

Case of constant arrivals – constant service --- there is no warning – theoretically -- it just crashes

Capacity - 1/3

Queueing theory

Arrivals – random or constant
Service – random or constant

Four possible cases

Random arrival rate

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This Photo by Unknown Author is licensed under CC BY-SA

Random service rate

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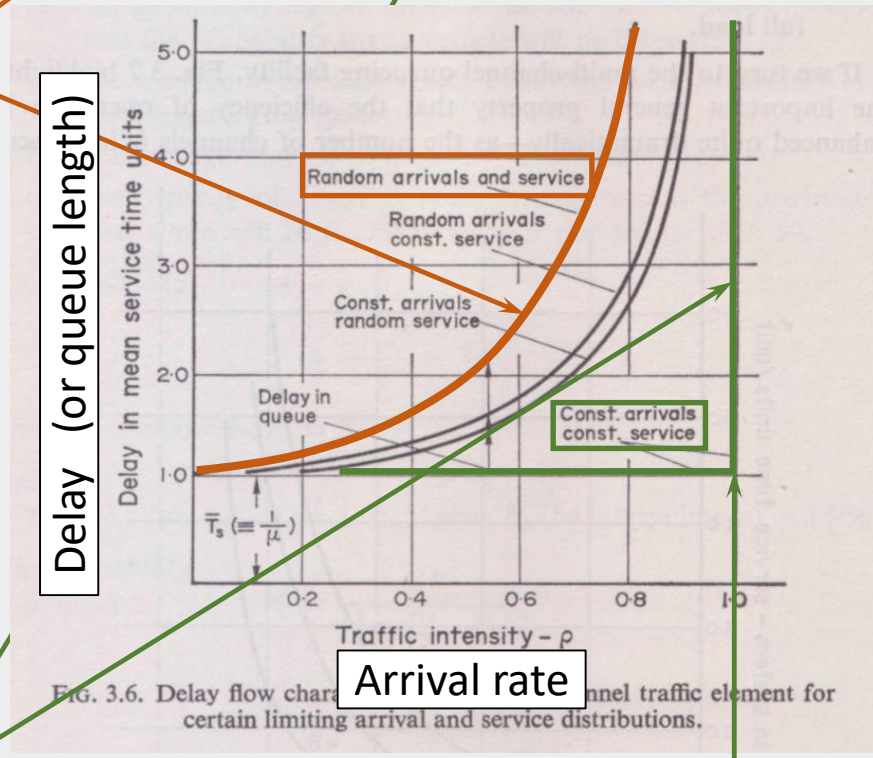
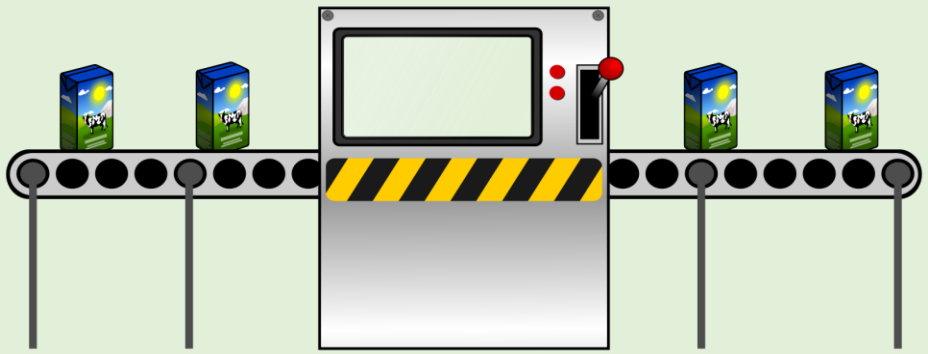
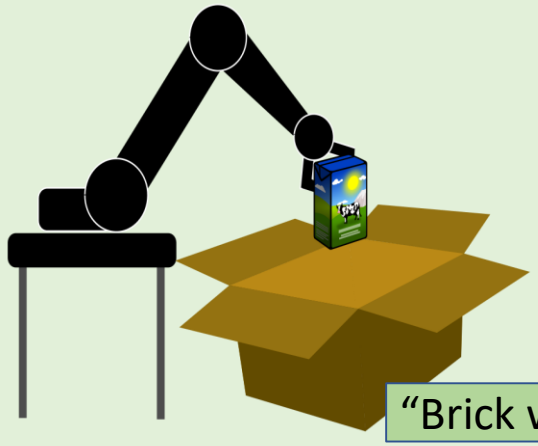


FIG. 3.6. Delay flow chara nnel traffic element for certain limiting arrival and service distributions.

Constant arrival rate



Constant service rate



"Brick wall" curve – no warning before capacity is reached

Capacity - 2/3

Now we can apply this theory

- For Port Botany:
  - Arrivals are random – there are small ships and large ships
  - Service is constant – close enough for individual containers
- Need to use this Blue curve – it is closer to the 1.0 capacity line.

This is a simplified explanation – but still holds.

In reality, Port Botany has three parallel berths

- Port Botany argues that a fourth birth is not required because there is spare capacity

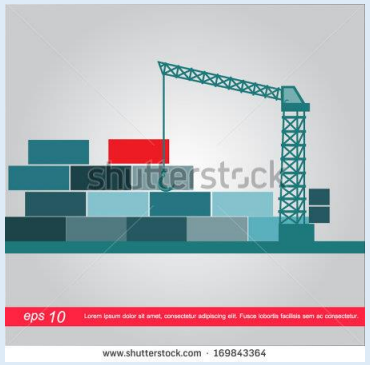
Rail capacity is closer to the factory capacity issue.

It is a good idea to believe the rail engineers' assessment on rail capacity

Capacity - 2/3

Random arrival rate

Constant service rate



Constant arrival rate

Constant service rate

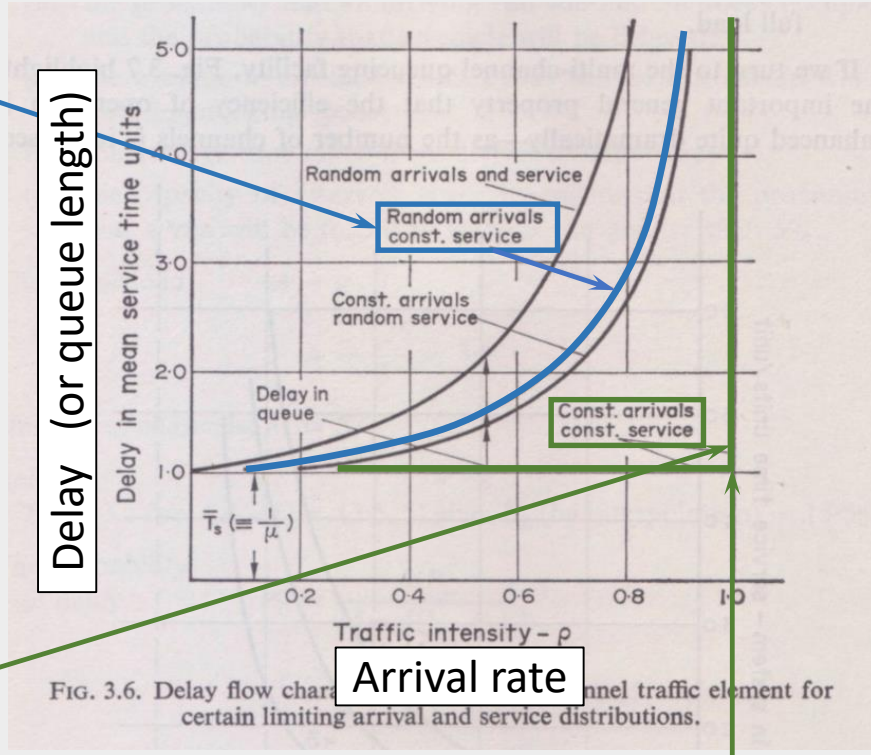


FIG. 3.6. Delay flow chara nnel traffic element for certain limiting arrival and service distributions.

"Brick wall" curve – no warning before capacity is reached

Capacity - 3/3

- X – Axis
  - imagine being in an aeroplane and seeing the cars on the road
  - In the bottom right-hand-side: the cartoon – showing “jam-density” - think of 12 km long holiday traffic queues
  - On the left-hand side – you are driving the only car on the road.
  - Density starts from zero – add more, and more cars to the road – until we reach “jam-density”

- Y-axis – these are the black tubes on the road to count cars travelling over those tubes

As more cars are added

- on the X-axis – move towards the jam-density
- on the Y-axis – more vehicles travel over the tubes.

Because of the road conditions they travel at the speed limit. This is shown with the green line.

At the max flow, there are enough cars

When more cars add added

- on the X-axis – move further towards the jam-density
- on the Y-axis – fewer vehicles travel over the tubes.

Drivers feel that the gaps between the cars are too close and reduce their speed, and therefore fewer cars travel over the tubes. This is shown with the red line.

As more and more vehicles are added – moving towards jam-density, vehicles slow down even further, and fewer vehicles travel over those tubes.

At jam-density – no one moves, speed = zero, and no one travels over the tube.

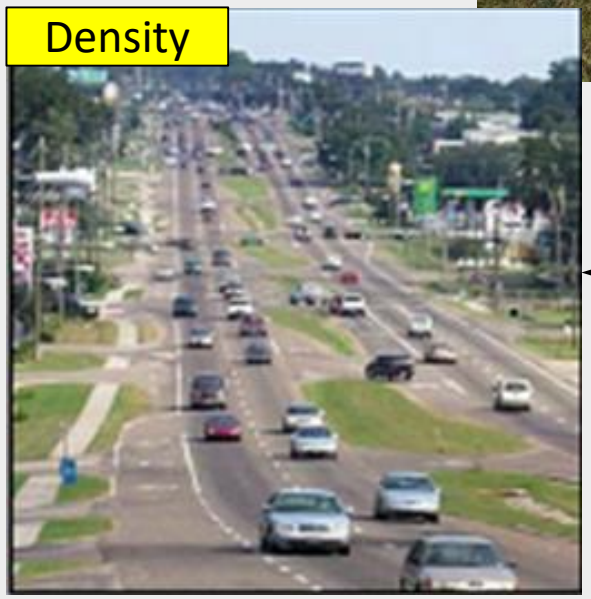
For traffic engineers, the capacity is at the peak of the graph.

- Where life for a traffic engineers becomes difficult is if they are given a traffic flow, they do not know if they are on the green line or red line.

If they are on the green line – the road system can handle some additional traffic

If they are on the red line – the road system definitely cannot handle the additional traffic

Flow – density relationship – "fundamental" diagram

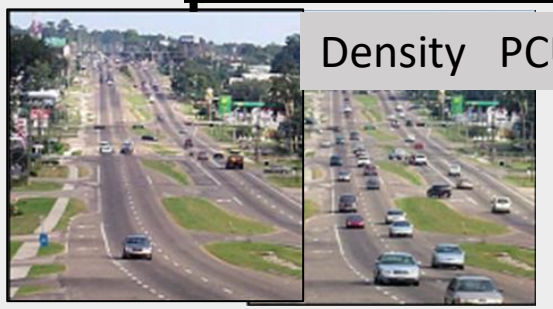


Optimal density = max flow

Traffic engineers: capacity

Flow PCU/hr/lane

same flow



Density PCU/km/lane

Jam density -- Flow = 0
-- Speed = 0

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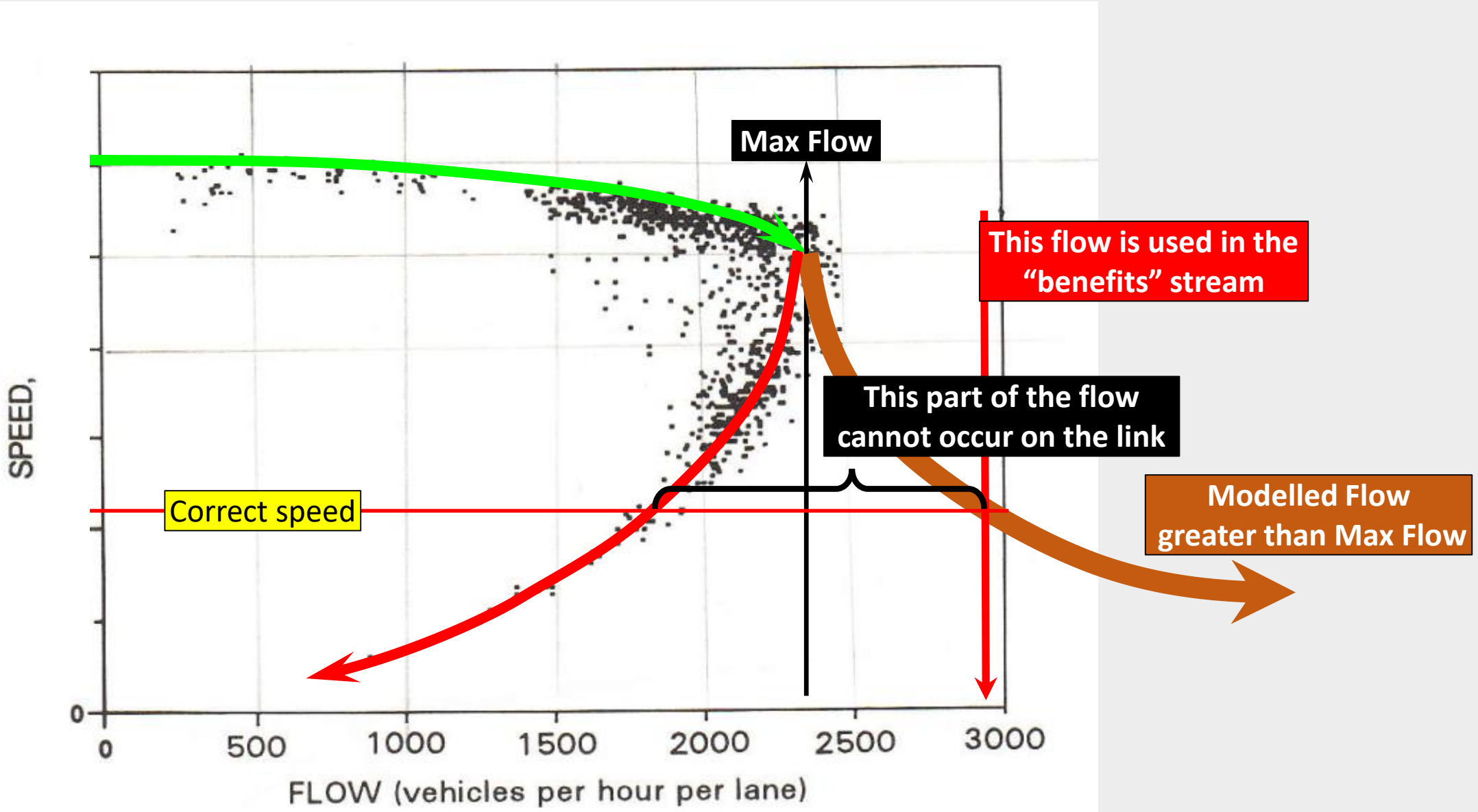
Fundamental diagram: – Speed-Flow relationship (strategic models)



This image shows the observed distances between vehicles on a 100 km/hr roadway in Melbourne

- X-axis the speed
- Y-axis the distance

From the top of the Y-axis

- If there are few cars on the road – large spacing – speed = 100 km/hr
- If more cars are added to the road, the spacing reduces – speed = 100 km/hr

- Critical spacing – there are “enough” cars on the road
- Any more – car drivers reduce speed, and accept a smaller spacing

SIMTA survey, circa 2010, showed speed on the M5 Georges River Bridge = 50km/hr-60 km/hr
You can eye-ball the expected spacing between cars.

Proposed trucks to be used for Moorebank Intermodal → larger than the spacing

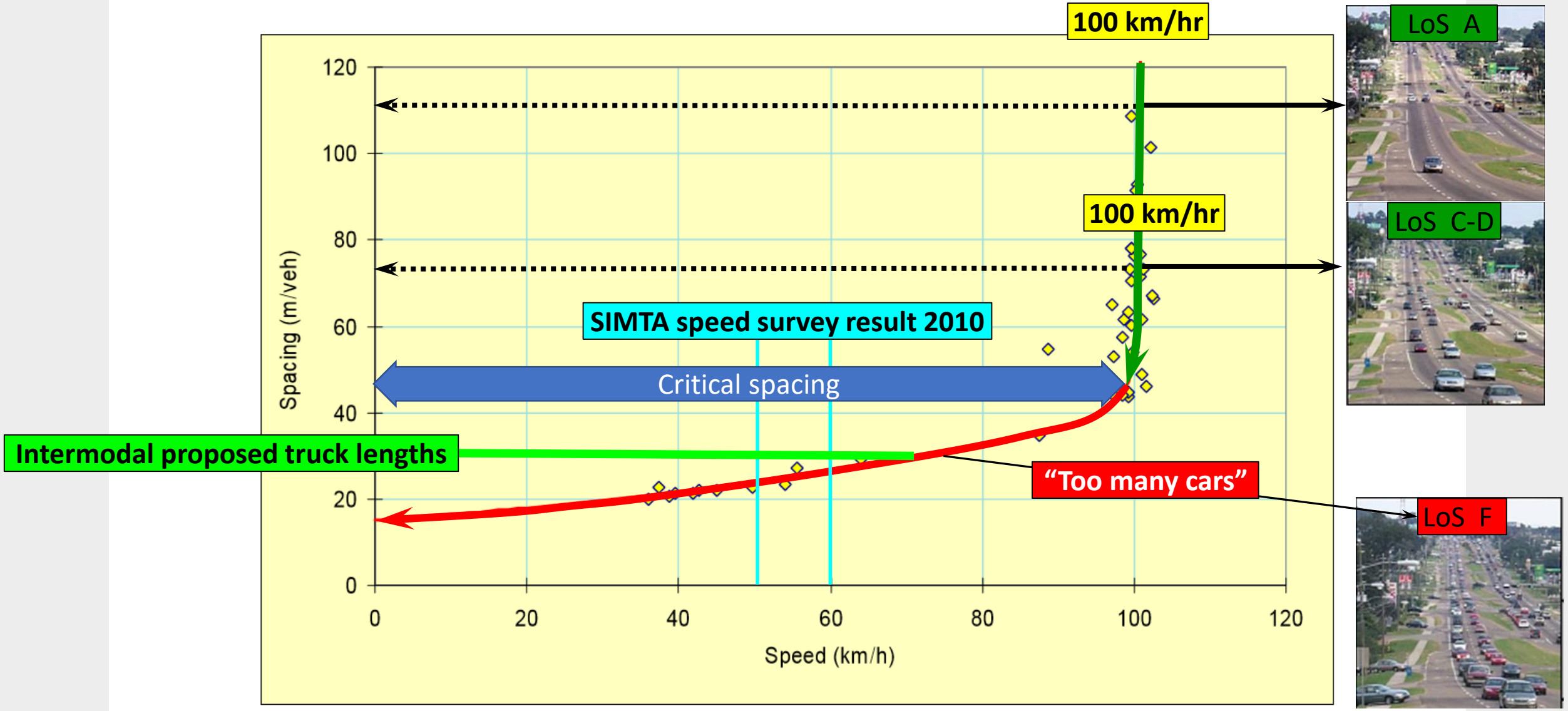


Figure 6.2 - Estimated and measured spacing - speed values for the freeway basic segment data collected in Melbourne (described in ARR 341)

http://www.sidrasolutions.com/Cms_Data/Contents/SIDRA/Folders/Resources/Articles/Articles/~contents/TXUJ8KTFPDGXXRBZ/AKCELIK_SpeedFlowModels(CAITR%202003)v1.pdf

Mr Craig Kelly MP asked us “Where are the Port Botany containers going” – emphasis on destinations inside Sydney

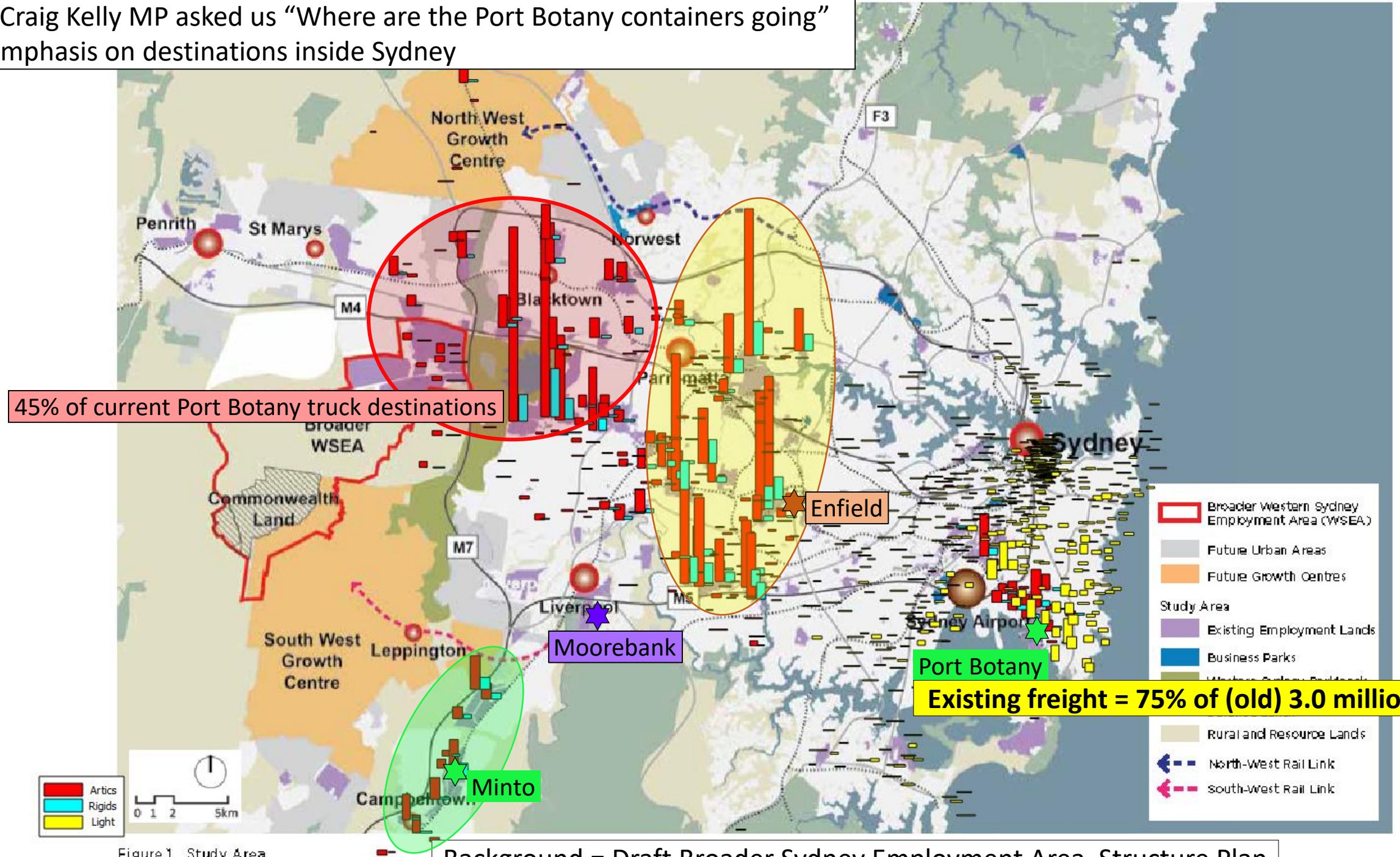


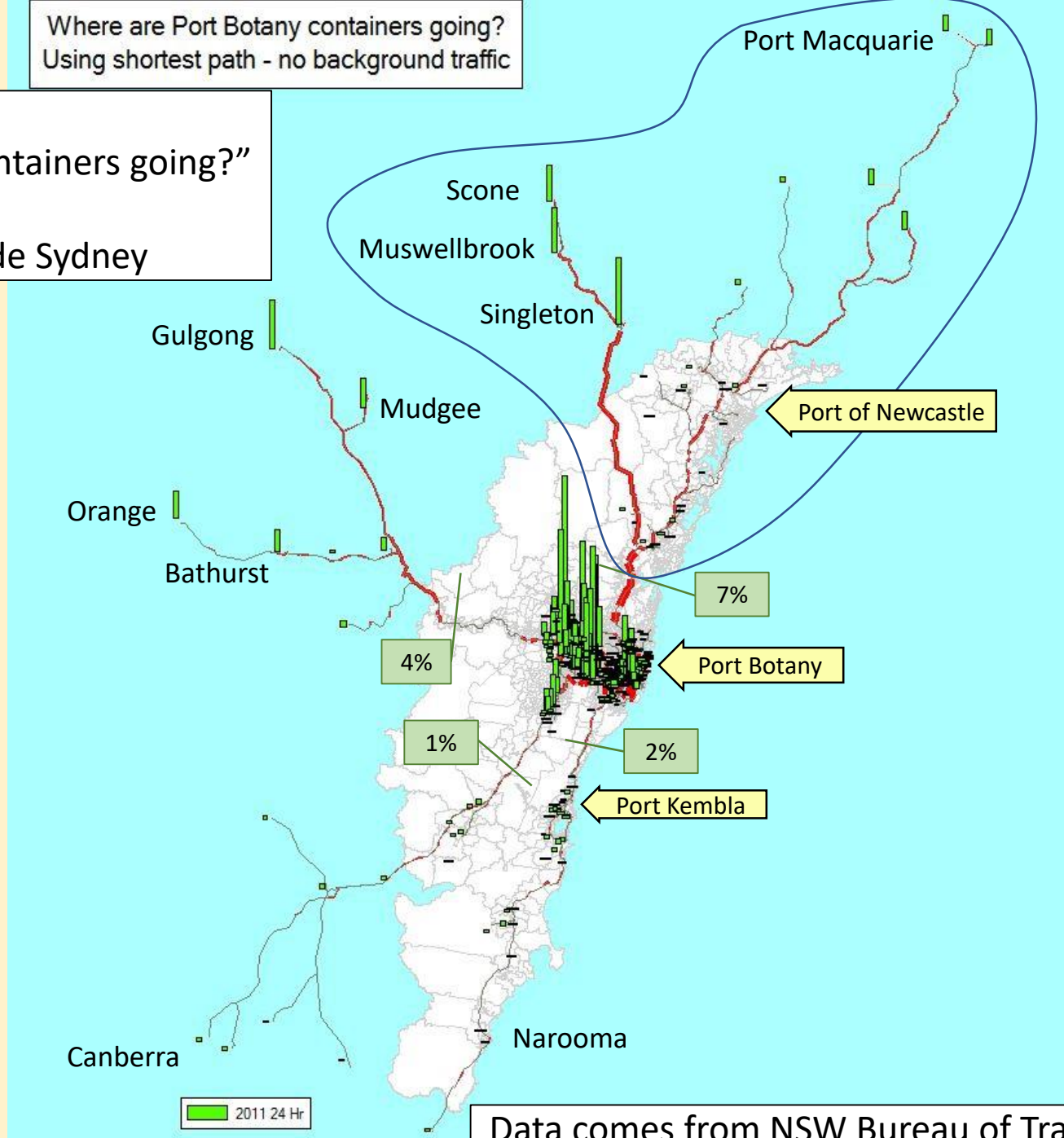
Figure 1 Study Area

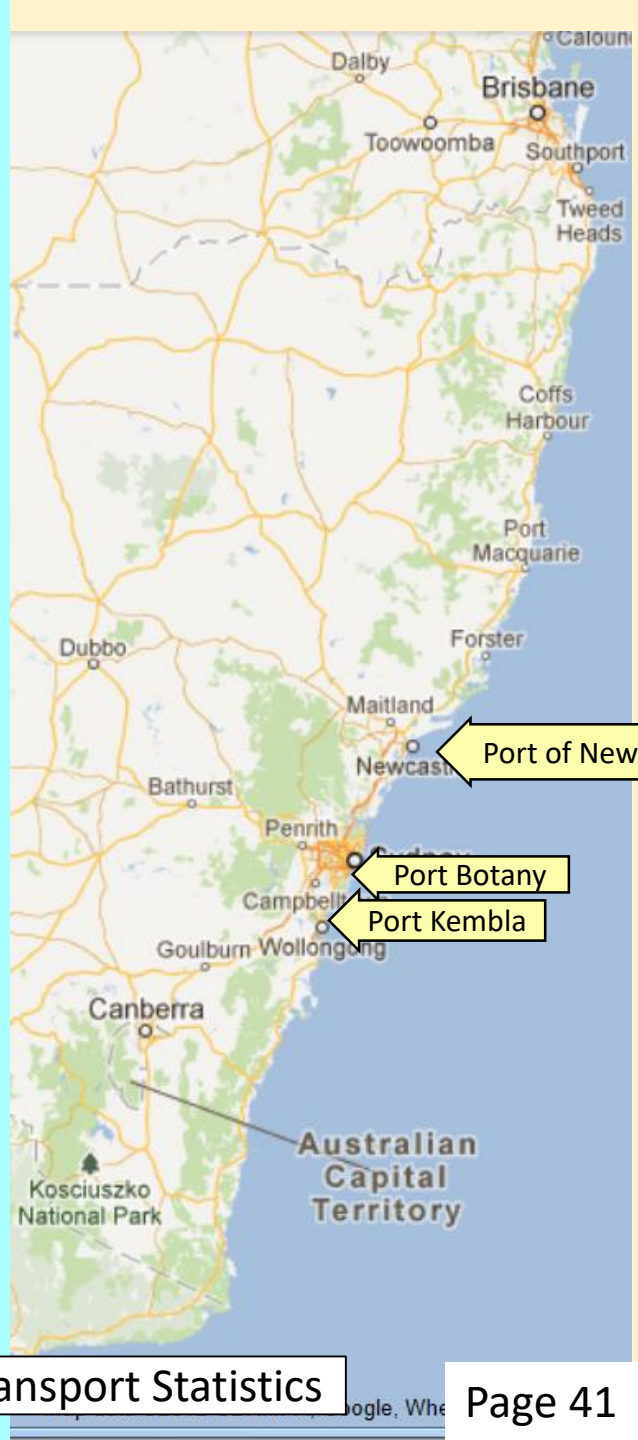
Background = Draft Broader Sydney Employment Area Structure Plan

Port Newcastle market

Mr Craig Kelly MP asked us:
"Where are the Port Botany containers going?"

Emphasis on destinations outside Sydney



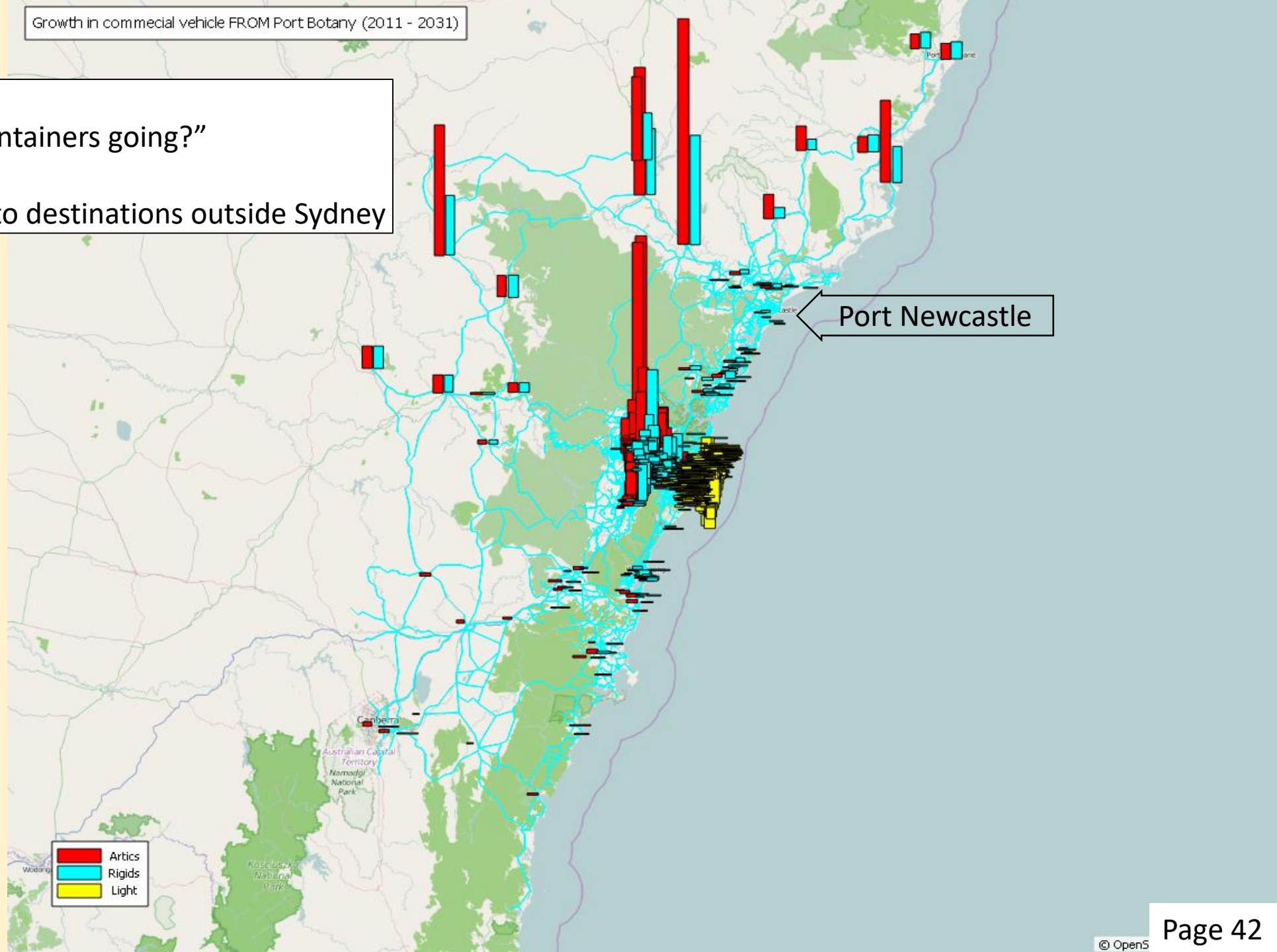


Data comes from NSW Bureau of Transport Statistics

Port Newcastle market

Mr Craig Kelly MP asked us:
"Where are the Port Botany containers going?"

Emphasis on **growth in freight** to destinations outside Sydney



modellers were asked to generate numbers as high as possible for their toll road modelling

- The Australian average, only 40% of the modelled traffic went to through the toll booths

A Sanity Check

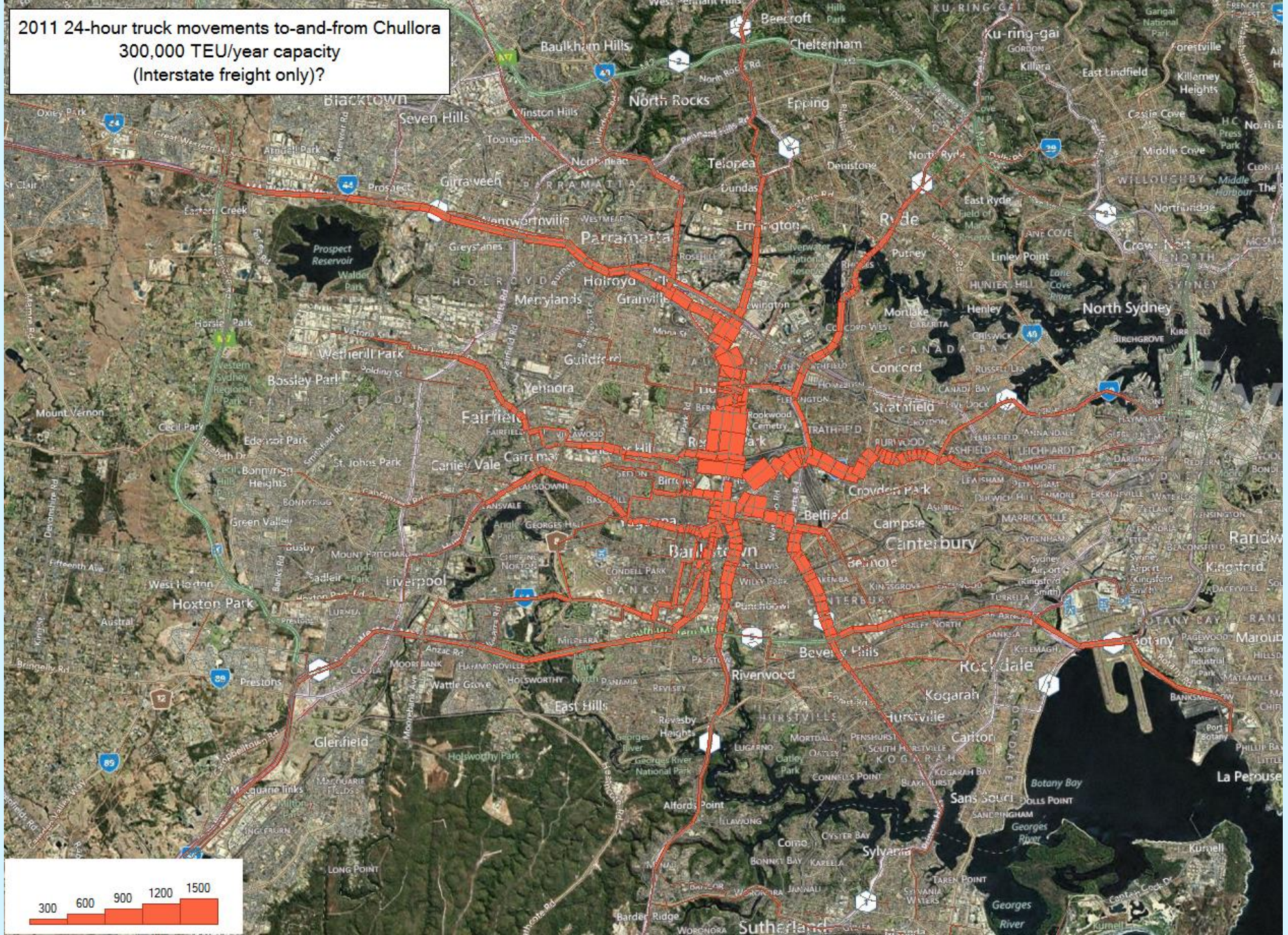
Intermodal	TEU	Daily Flow	Factored to 1 Mil TEU	Comment
Port Botany	2,000,000	4,700	2,350	No warehousing
Camellia	80,000	5,100	63,300	Warehousing
Chullora	300,000	7,400	24,800	Warehousing
Enfield	300,000	1,500	4,900	Warehousing
Leightonfield	80,000	7,600	95,000	Warehousing
Minto	150,000	5,000	33,000	Wareh
Yennora	170,000	6,000	35,000	Warehousing
SIMTA	1,000,000	2,600	2,600	Warehousing
Average			42,666	
TfNSW	2,000,000	20,700	10,350	

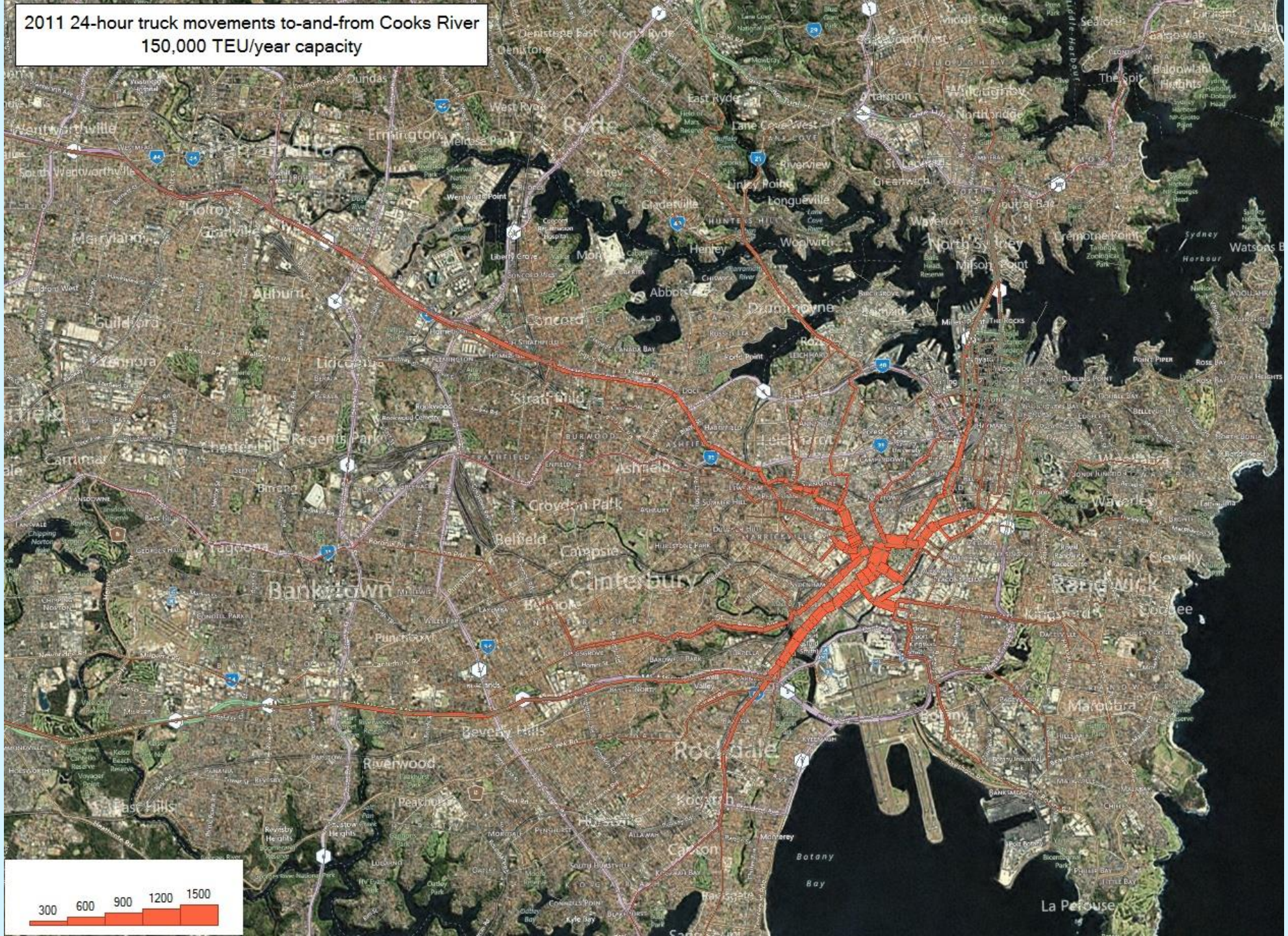
In the case of intermodal terminals,
the lowest possible numbers were required.

The following images show the traffic generated from the various intermodals.

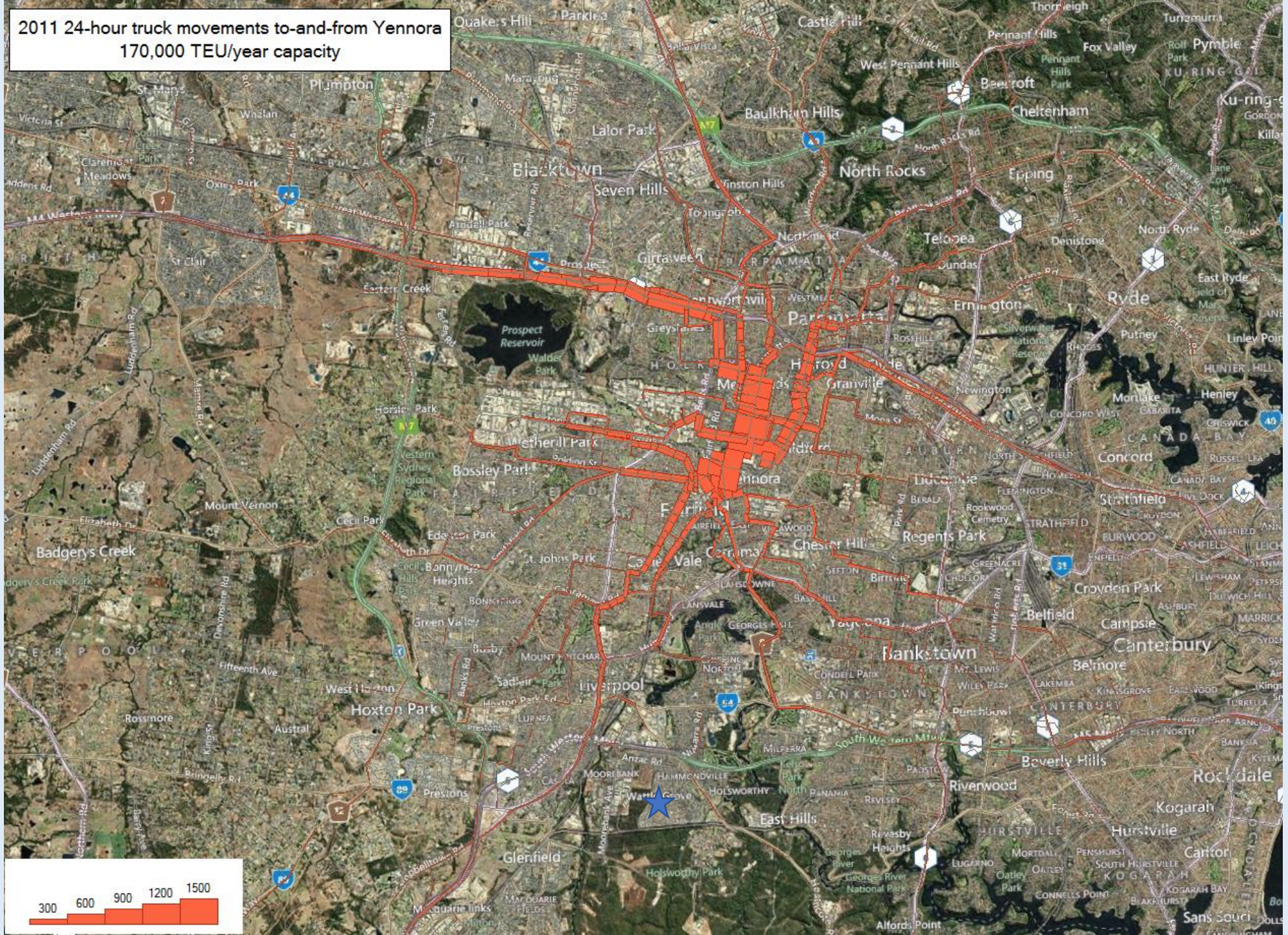
Generally speaking the traffic fans out in a star shape, but is modified by the road network
– which is impacted by rivers and railway lines

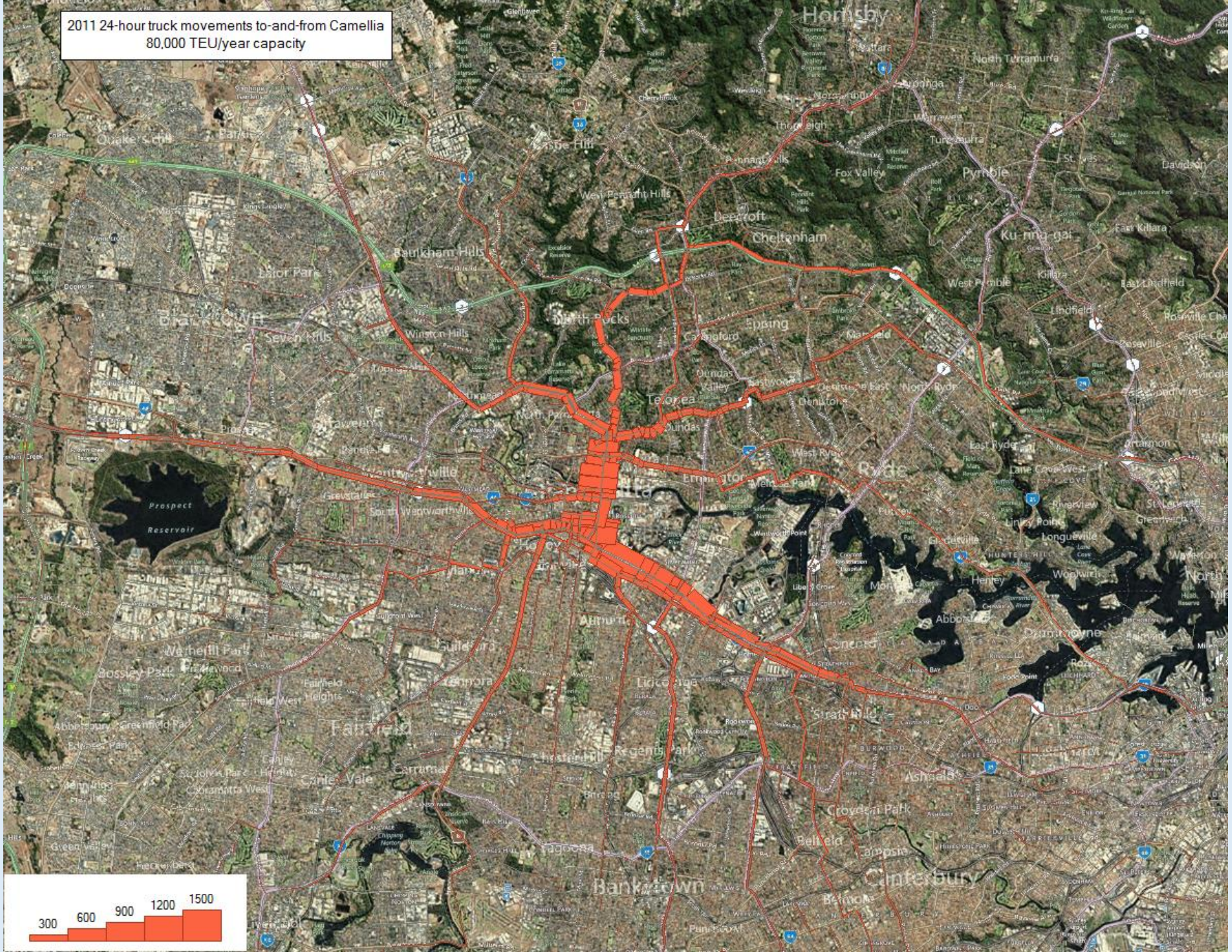
The important aspect is – when considering intermodal traffic – to also consider this distribution traffic


2011 24-hour truck movements to-and-from Chullora
300,000 TEU/year capacity
(Interstate freight only)?
300
600
900
1200
1500


2011 24-hour truck movements to-and-from Cooks River
150,000 TEU/year capacity
300
600
900
1200
1500


2011 24-hour truck movements to-and-from Minto
150,000 TEU/year capacity
300
600
900
1200
1500


2011 24-hour truck movements to-and-from Yennora
170,000 TEU/year capacity
300
600
900
1200
1500


2011 24-hour truck movements to-and-from Camellia
80,000 TEU/year capacity
300
600
900
1200
1500

Employment at Intermodal Terminal

Employment estimates for employment is widely over-estimated.

A recent American study showed that the

- max employment achieved was 60% of estimates
- Min employment achieved was -11% of the estimates

http://www.memphis.edu/ifti/pdfs/research_job_creation_factors.pdf

Intermodal Freight Facilities – Actual job creation

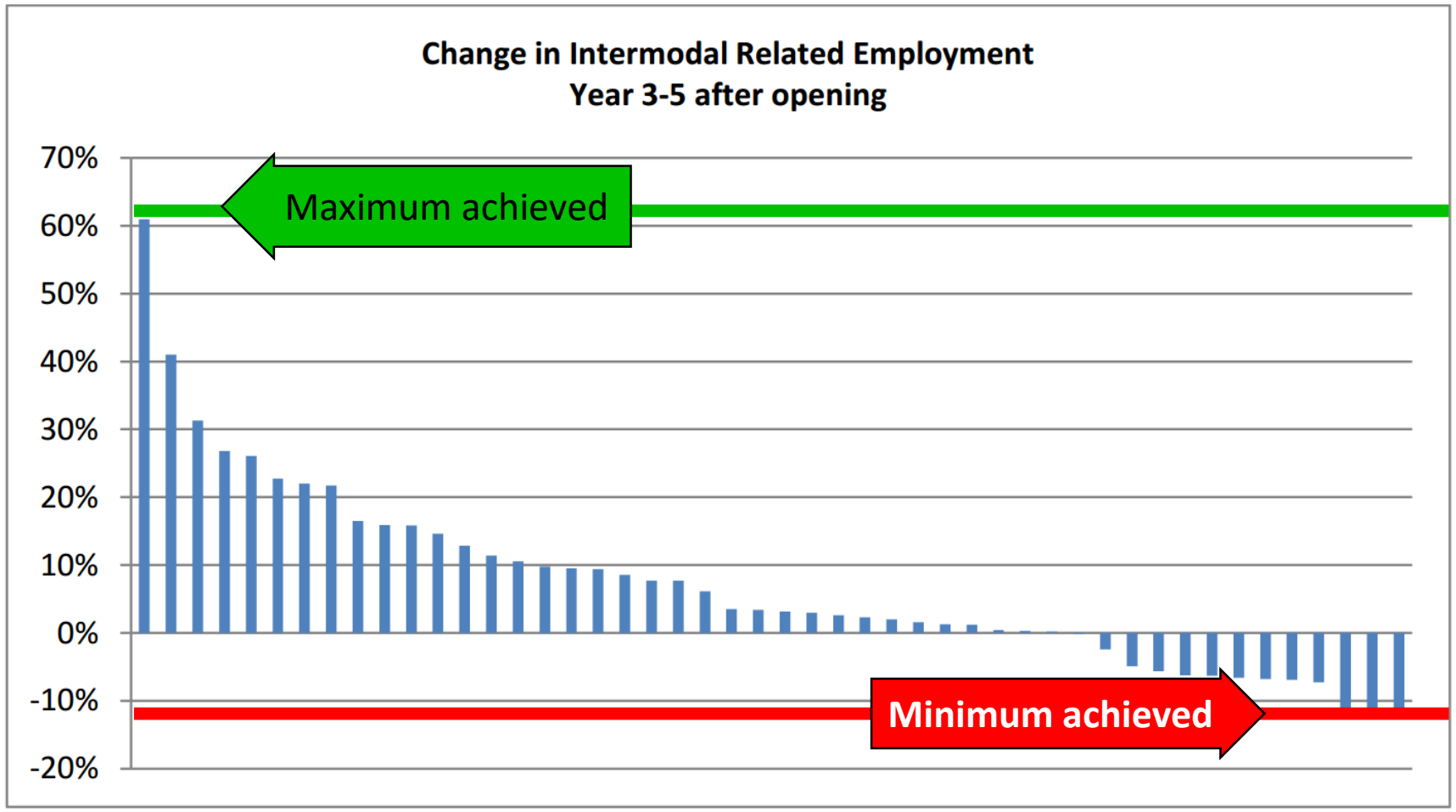


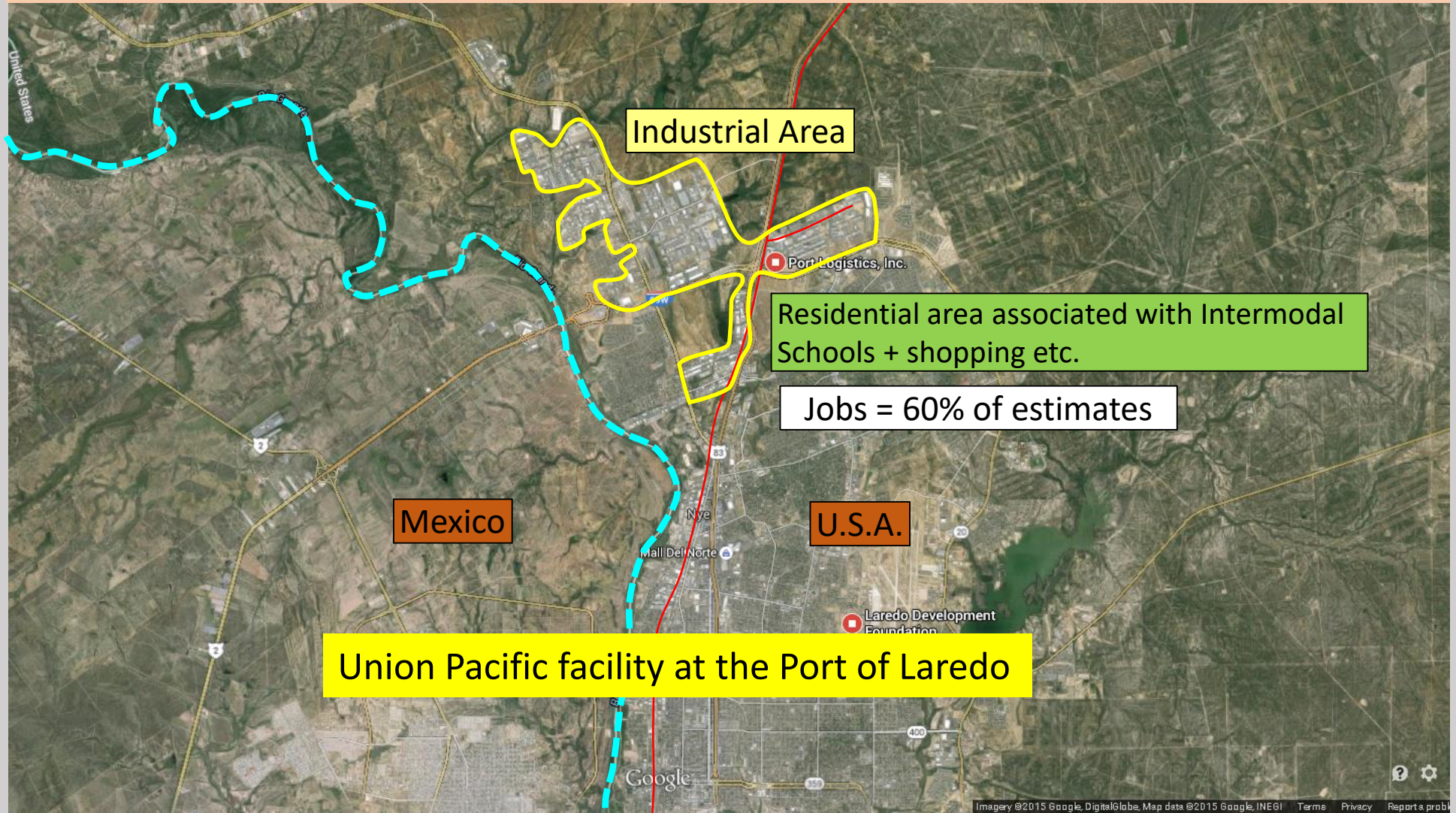
Figure 1: Change in Intermodal Related Employment at a Sampling of IFFs

Laredo's economy is based on international trade with Mexico (and USA).

Most major transportation companies have a facility in Laredo.

The city's location on the southern end of I-35 close to the manufacturers in northern Mexico promotes its vital role in trade between the two nations.

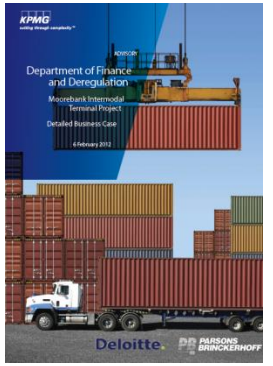
the city population was 236,191



Detroit Intermodal freight facility actual experienced declines in intermodal related employment

4. Using this policy the road network capacity will not meet demand

- **Connection to the SSFL** – the rail connection into the site would cross the Georges River at the northern end of the site. The IMEX and Interstate trains would share this connection.
- **Road access –** the Project is expected to require the widening of Moorebank Avenue to a four-lane carriageway. The design caters for additional turning lanes to accommodate the increased traffic volumes estimated to occur in 2029/30.



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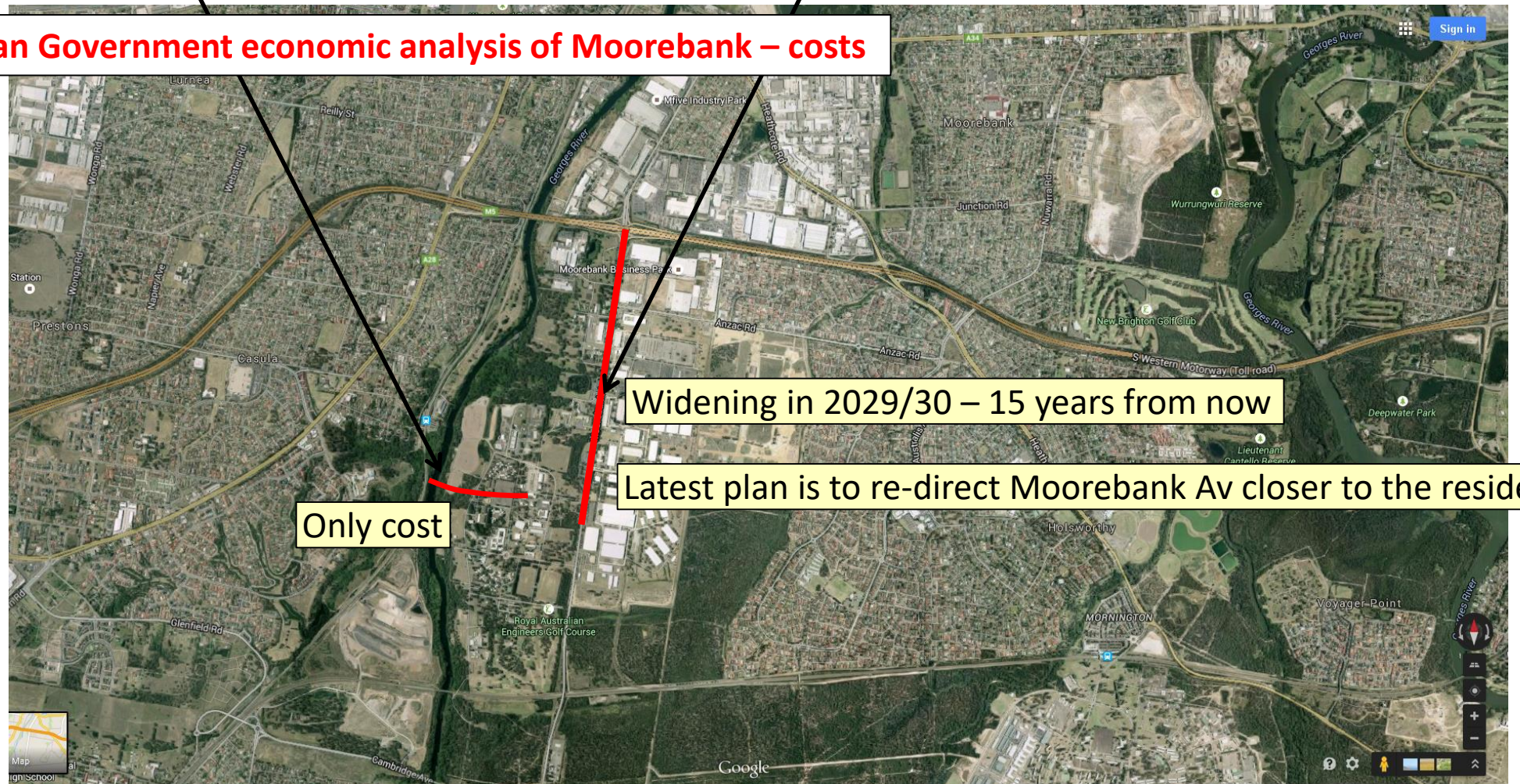
Australian Government economic analysis of Moorebank – costs



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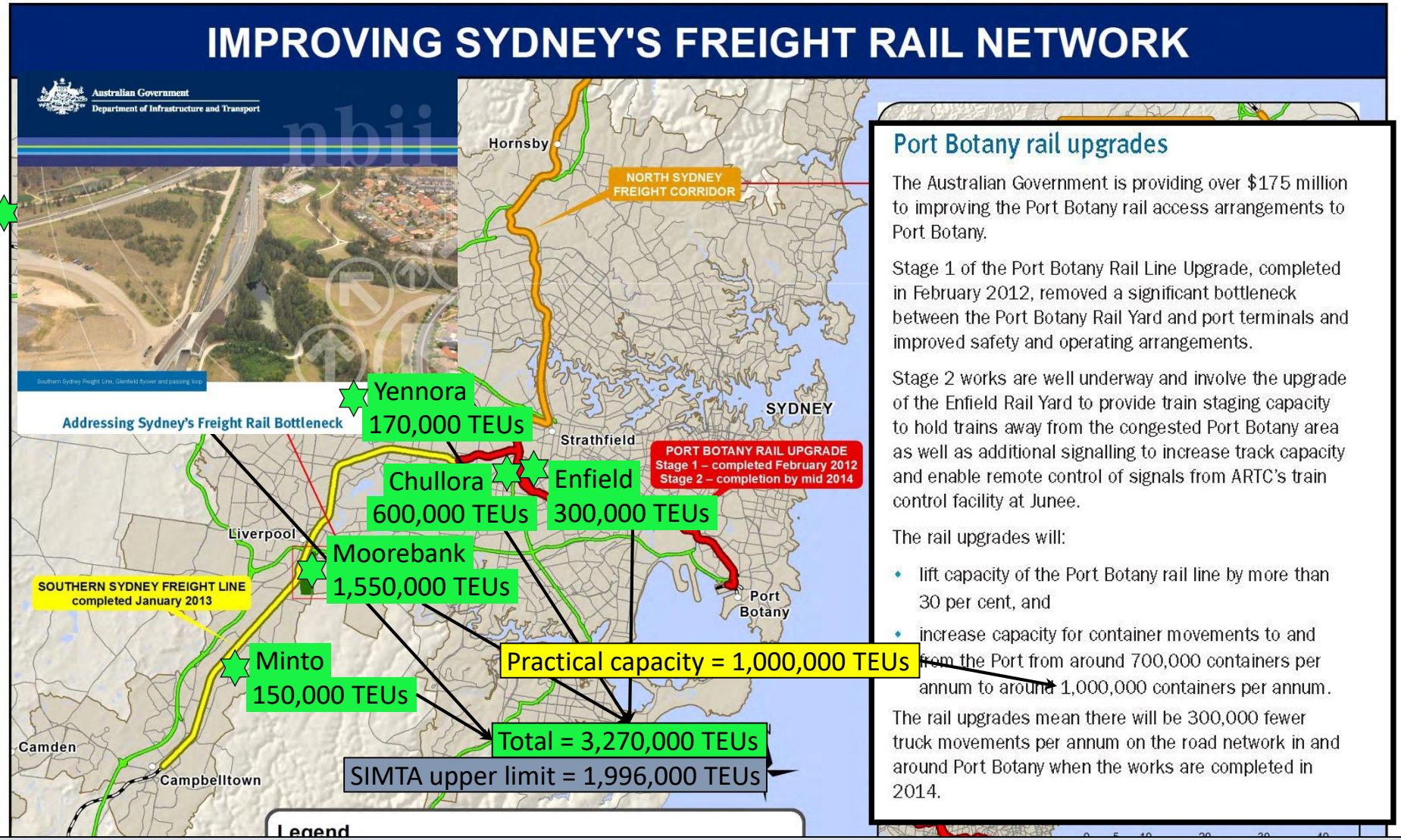

By our estimates and knowledge of the Sydney Metropolitan Freight Network, 1.96 million TEUs is at the upper limit of rail capacity serving Port Botany – capacity not throughput, i.e. 48 train paths per day = 96 trains x 84 TEU train capacity, x 80% train utilisation x 364 days – 15% redundancy = 1.996 million